AN INVESTIGATION OF FLUID FLOW THROUGH ORIFICES IN SERIES

ROBERT A. BOSCOLE
JOHN M. MARTIN
WILLIAM E. DENNIS

Cambridge, Massachusetts,
May 20, 1949.

Professor J. S. Newell,
Secretary of the Faculty,
Massachusetts Institute of Technology,
Cambridge, Massachusetts.

Dear Sir:

In accordance with the requirements for the Degree of Naval Engineer, we submit herewith a thesis entitled "An Investigation of Fluid Flow Through Orifices in Series".

Respectfully,

[illegible]

[illegible]

by

Robert A. Boscolo
Lieutenant, U. S. Navy
B.S., U. S. Naval Academy, 1943

John A. Martin
Lieutenant, U. S. Navy
B.S., U. S. Naval Academy, 1943

William E. Dennis
Lieutenant (jg), U. S. Coast Guard
B.S., U. S. Coast Guard Academy, 1943

Submitted in Partial Fulfillment

of the Requirements for the Degree of

Naval Engineer

from the

Massachusetts Institute of Technology

1949

ACKNOWLEDGMENT

The authors wish to express their appreciation to Professor W. M. Rohsenow, who suggested the subject and under whose supervision the investigation was conducted.

The authors are also indebted to Professor J. A. Rooney for his aid in judging the performance value of the double orifice.

TABLE OF CONTENTS

SYMBOLS

m - $\dfrac{\text{diameter of single orifice}}{\text{pipe diameter}}$

m' - $\dfrac{\text{diameter of upstream orifice}}{\text{pipe diameter}}$

m'' - $\dfrac{\text{diameter of downstream orifice}}{\text{pipe diameter}}$

D - orifice diameter (inches)

d - inside pipe diameter (inches)

Re - Reynolds number

a - $\dfrac{\text{distance between orifice plates}}{\text{pipe diameter}}$

ν - kinematic viscosity (ft^2/second)

q - rate of flow (ft^3/minute)

K - Discharge coefficient

Subscripts 12 indicate coefficient based on radius taps across the upstream (or single) orifice plate. Subscripts 14 indicate coefficient based on radius taps across the double orifice combination. Subscripts 1c indicate coefficient based on pipe taps located 2.5 diameters upstream from the upstream orifice and 8 diameters downstream from the downstream orifice.

Δh - manometer pressure differential in inches of water.

A - orifice area (square inches)

T_w - temperature of water in degrees, Fahrenheit

I. SUMMARY

The object of this investigation was to determine the performance characteristics of two axially coincident orifices in series.

The study was conducted while varying the following parameters:

(a) the axial distance between the orifices,

(b) the size of each orifice,

and
(c) the flow rate; i.e., the Reynolds Number.

In varying these parameters the number of possible combinations is infinite, but the 350 runs made in this investigation clearly show the range in which the double orifice acts as an improved measuring device.

It can be concluded from the Results that a double orifice can be devised that will give the same available measuring head as a single orifice but with an improved static pressure recovery. Since the upstream orifice of the double orifice combination has been shown by this investigation to be independent of the spacing distance and the size of the downstream orifice, a double orifice measuring system can be devised using the upstream orifice for flow measurement and the downstream orifice for improving pressure recovery. This has the advantage that standardized coefficients for the single orifice can be used for the

upstream orifice.

In order to ascertain the optimum double orifice combinations it is recommended that further tests be made in the range of orifice spacings from zero to one pipe diameters.

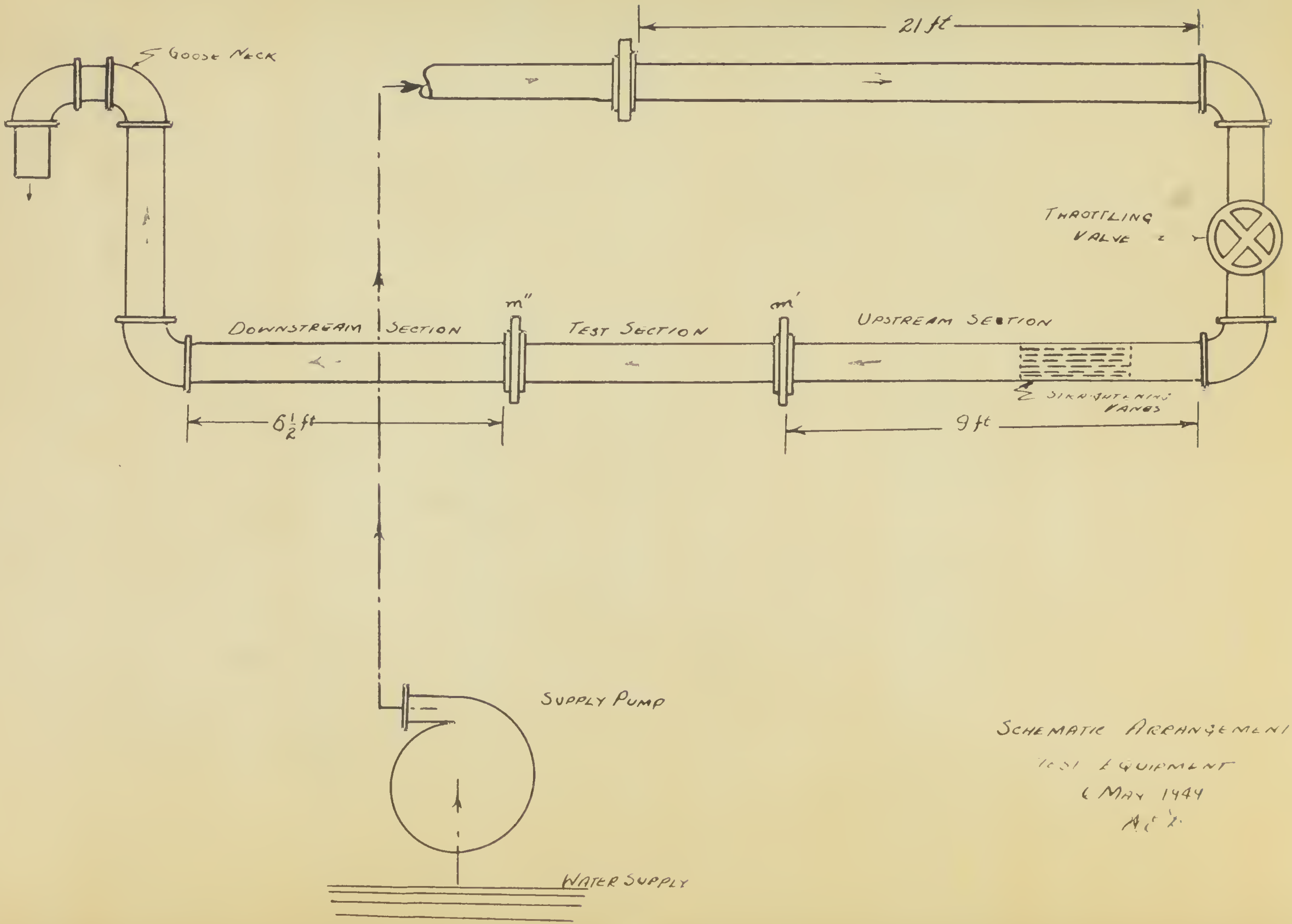
II. INTRODUCTION

The purpose of this investigation has been to study any possible interactions between two axially coincident orifices placed in series in a pipeline.

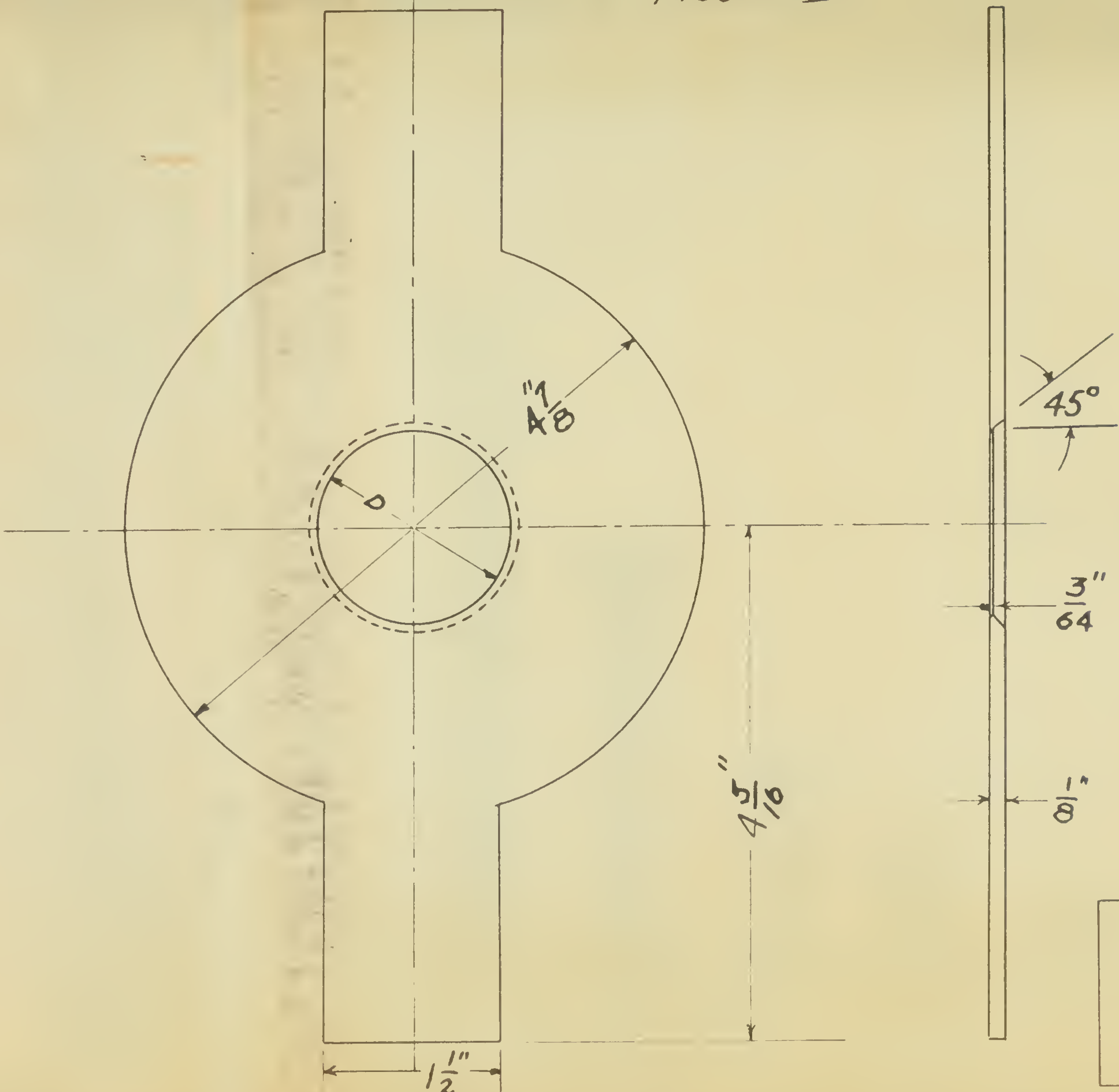
A search of the literature revealed only a few pertinent articles on this subject. An experiment was reported in MECHANICAL ENGINEERING (1) in which fluid flow through orifices in series was undertaken using water. This test, made by H. W. Dietart at Rice Institute, was run with equipment very much smaller than that used in this investigation. For example, the orifice diameters were 0.038" and the pressure head was varied from 0" to 17" of water. The results of an investigation by Littaye (2) show that the influence of surface tension is preponderant at low velocities and for small diameter orifices. For this reason it was felt that the material of Dietart would be of little value in our investigation.

A very interesting article by G. Walzholz (3) entitled "Die Doppelblende" was found to bear directly on the subject of this thesis. Walzholz ran a carefully controlled experiment using two orifices in series with variable distances between the orifices. He reports that an arrangement of orifices was found which gave a discharge coefficient extensively independent of Reynolds Number.

This present investigation closely parallels the German work with two major exceptions. 1.) A detailed analysis is made of the axial pressure distribution along the orifice combination. 2.) Detailed analysis is made of the discharge coefficient of the combination as compared to that of a single orifice. It was felt that an improved flow measuring device might be developed which would give the same available measuring head as a single orifice plate but with an improvement in the percentage of static pressure recovery.



Schematic Arrangement of Test Equipment
6 May 1944

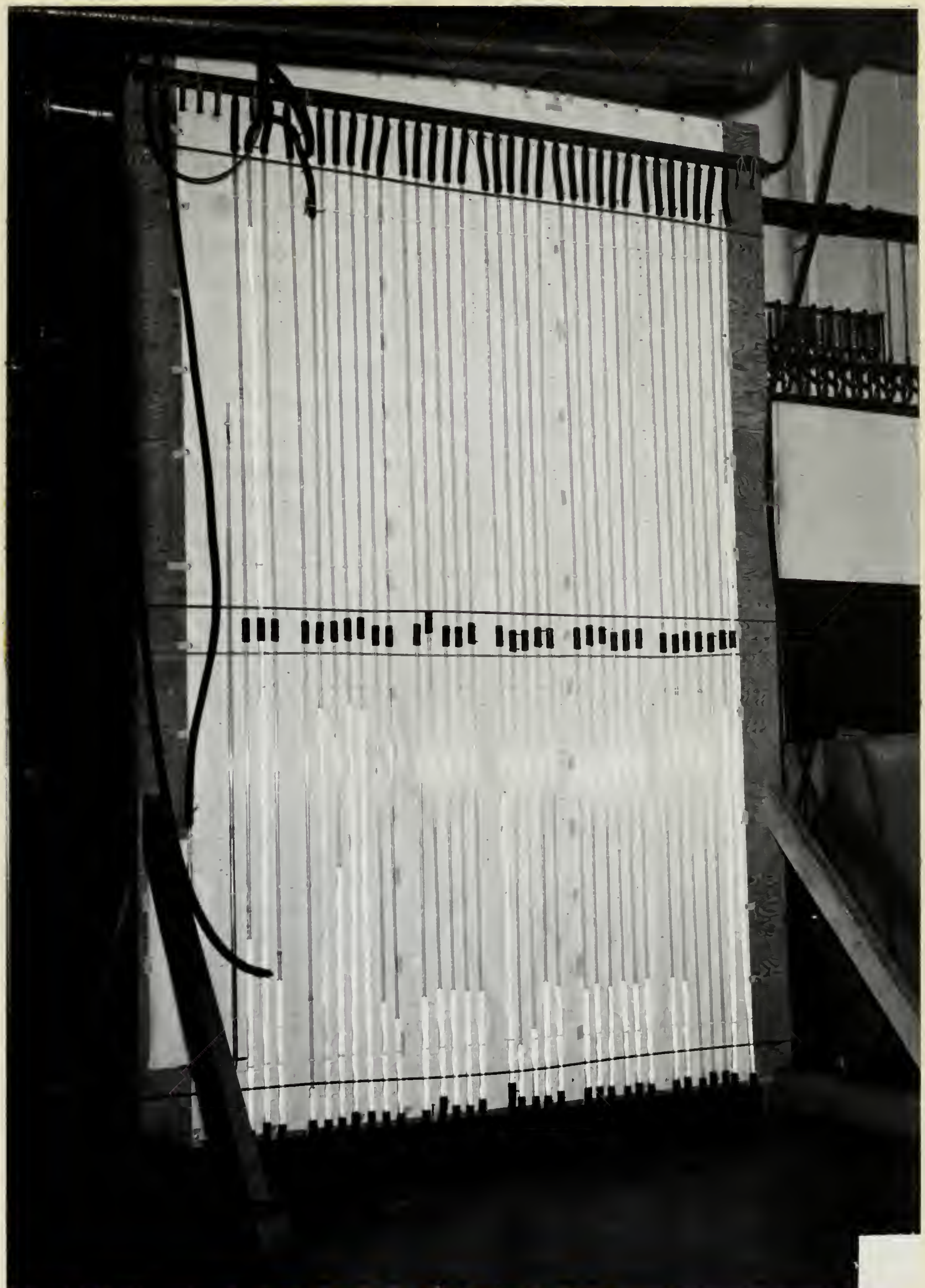


ORIFICE PLATE

SCALE $\frac{3}{4}'' = 1''$

FIGURE III A   TEST SECTIONS AND ORIFICE PLATES

FIGURE III B



MANOMETER BOARD

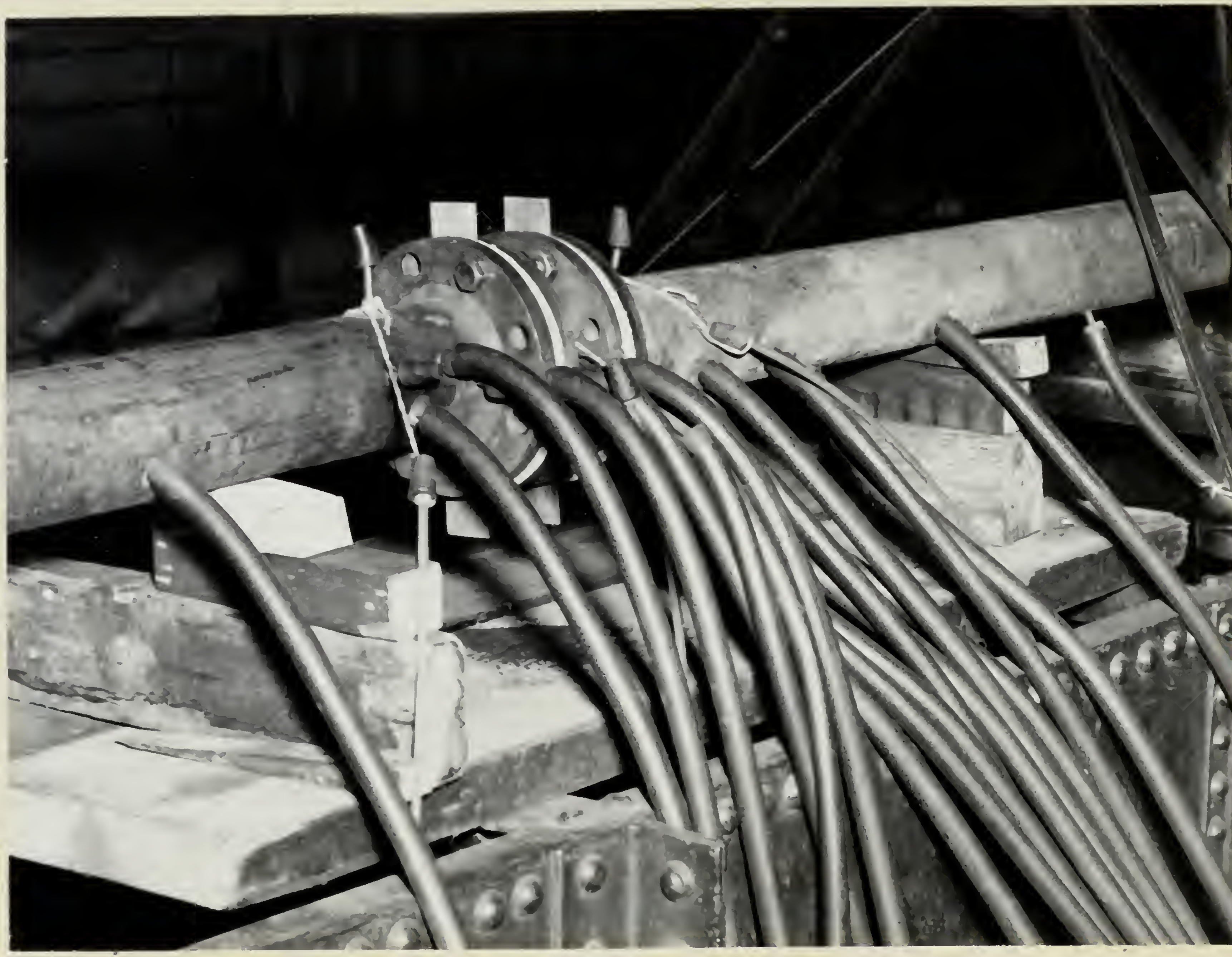


FIGURE III C   TYPICAL SETUP

Equipment

Piping

The basic piping consisted of three inch nominal diameter seamless steel tubing flanged together in series. For clarity, the first section shall be called the upstream section, the third called the downstream section, and the center section called the test section. The upstream section was nine feet in length with a bundle of ½" diameter tubing two pipe diameters in length placed in the inlet end for the purpose of straightening the flow. Seven test sections were used of lengths varying from 2½" to 48". The downstream section was 6½ feet long and had a gooseneck fitted on the outlet end which returned the water to the supply level thus keeping the test section full of water even at low rates of flow. Pressure taps were installed in the walls of all sections of the piping as well as in the flanges. The holes in the flanges were 1/8" in diameter and those in the piping were 1/16" in diameter. The upstream section had five taps, the downstream had twelve taps and each test section had a number consistent with the length of that particular section. All taps were staggered so as to minimize the influence of any one tap upon the next in the line of flow. Taps were installed in the top of the pipe before and after each orifice plate to vent any possible trapped air.

The orifice plates, made in accordance with A. S. M. E. specifications, were sharp edged and manufactured from 1/8" sheet brass. (See Figure II). The ratios of orifice diameter to pipe diameter of the plates used in these tests were 0.7, 0.6, 0.5, 0.4 and 0.3. Tabs were left on opposite sides of the plates for ease in centering the orifice between the flanges. One orifice was inserted between each end of the test section and the upstream and downstream sections.

The manometer board consisted of thirty-one glass tubes, 8 feet in length, 13mm. outside diameter, all connected at their upper ends to a common manifold by one-half inch rubber tubing. Air could be pumped into the manifold by means of a bicycle pump and check valve thus forcing down the level of the fluid in all the tubes to any desired level. This arrangement materially reduced the required height of the manometer tubes and allowed the use of the full length of the board to measure the maximum pressure differential in the system. The lower ends of the manometer were connected to the taps in the pipeline by one-half inch rubber tubing. This arrangement permitted the use of the water from the pipeline as a measuring fluid in the manometers.

A mercury manometer was used to measure the pressure difference between the atmosphere and the manifold. The effects of surface tension and capillarity were minimized by the use of the 13 mm. tubing.

Flow Measurement

The flow was measured by a calibrated orifice plate located about twenty-five feet upstream from the test equipment. Leads taken across this orifice were connected with rubber tubing to the bottom of two [illegible] foot glass tubes which in turn were interconnected through a tee at their upper ends. Air could be introduced through the third connection of this tee and thus equally depress both columns of water when the pressures were too high to be observed within the length of the glass tubes (Ref. 4, p.[illegible]). Means were provided for venting the lines going to the manometer.

Water Supply

Water was pumped into the pipeline by a motor-driven centrifugal pump rated at [illegible] gallons per minute at 35 lbs. per square inch. Flow was varied by means of a throttling valve upstream from the straightening vanes. The system discharged into a channel which in turn emptied into large calibrated measuring tanks.

The specifications as set forth in the A.S.M.E. Power Test Codes (Ref. [illegible]) were used as a guide in the design and construction of all equipment.

III. PROCEDURE

This investigation involved the variation of the following parameters. The upstream orifice plate was varied using 0.3, 0.4, 0.5, 0.6 and 0.7 pipe diameter ratios for a 0.5 pipe diameter ratio orifice plate downstream. For each combination the flow was varied in about five steps so as to cover approximately the range of Reynolds Number from 5×10^4 to about 2×10^5. The process was then repeated for a 0.6 pipe diameter ratio orifice plate downstream. This entire routine was carried out for each length of test section, seven in number. The completed data consists of about 320 separately recorded runs. As recorded, the data shows the static pressure readings in inches of water for each tap, the measuring orifice pressure difference in inches of water, the manifold pressure in inches of mercury, the barometric pressure in inches of mercury, and the water temperature in degrees Fahrenheit. When the flow rate extended beyond the capacity of the measuring orifice manometer it was determined by the use of the calibrated tanks. The pipeline was adequately vented before each run so as to purge the system of any entrapped air.

The number of taps used was sufficient to delineate the static pressure curve from 3.32 diameters upstream from the

first orifice plate to 3.37 diameters downstream from the second or downstream orifice plate. The static pressure was read to the nearest 0.05 inch. The original data is tabulated in the Appendix of this report. The flow rate was varied over as great a range as was believed would give accurate data. The upper limit of flow rate was determined either by the pump capacity or the maximum pressure differential that could be measured on the eight foot manometer board. The lower flow rates were limited by the sensitivity of the calibrated measuring orifice. (See figure 1(a)). Tank readings to accurately determine low flow rates require very long periods of steady flow. The time required to perform such runs was prohibitive compared to the apparent value of the results to be obtained.

The data were used to compute and plot curves of discharge coefficient, K, versus Reynolds Number, and Variation of Static Pressure along the length of the test pipeline. The discharge coefficients carry three different subscripts which are determined by the points at which the pressure readings were taken. K_{12} is determined by the use of radius taps on either side of the upstream orifice. K_{14} is also determined by the use of radius taps; however, one

is located upstream from the first or upstream orifice and the other is at a point downstream from the second or downstream orifice. K_1 are one pipe radius in length from their respective orifice plates. K_{10} is based upon the use of pipe taps located at points 2½ pipe diameters upstream from the first orifice and 3 pipe diameters downstream from the second orifice. All discharge coefficients include the velocity of approach factor.

Cross curves of K for a constant value of Reynolds Number equal to 10^5 were plotted for each spacing distance and downstream orifice size for variations in the upstream orifice diameter ratio.

The static pressure curves were plotted on a percentage basis with unity representing the difference between the maximum pressure upstream and the minimum pressure reached within the system.

A plot also was made of the Percent Recovery in Static Pressure versus Orifice Spacing for each orifice combination.

IV. RESULTS

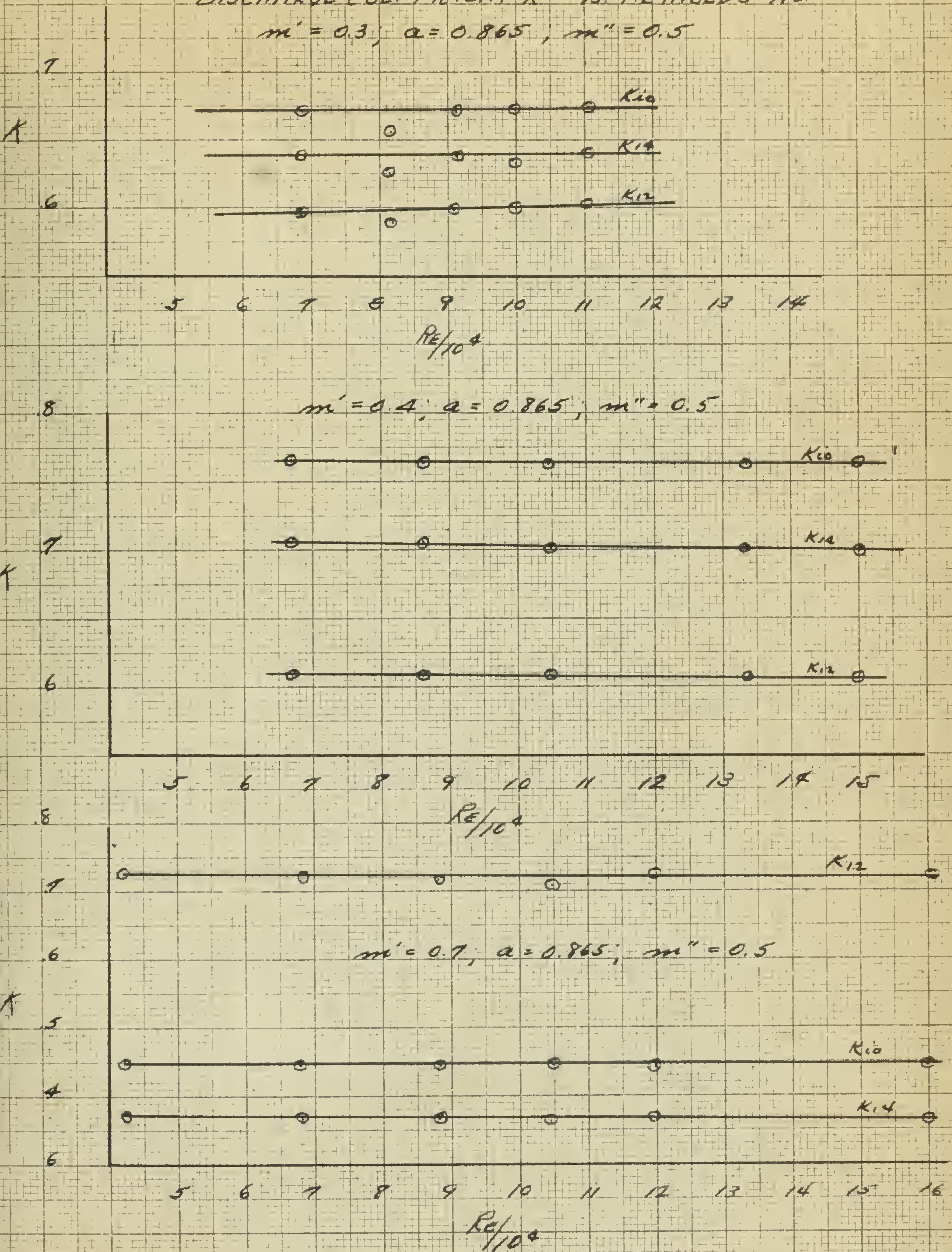
CURVE OF DISCHARGE

COEFFICIENT, C, VERSUS

REYNOLDS NUMBER, Re

FIGURE IV

DISCHARGE COEFFICIENT K vs. REYNOLDS NO.



5/7/44

FIGURE V

DISCHARGE COEFFICIENT K VS REYNOLDS NUMBER Re

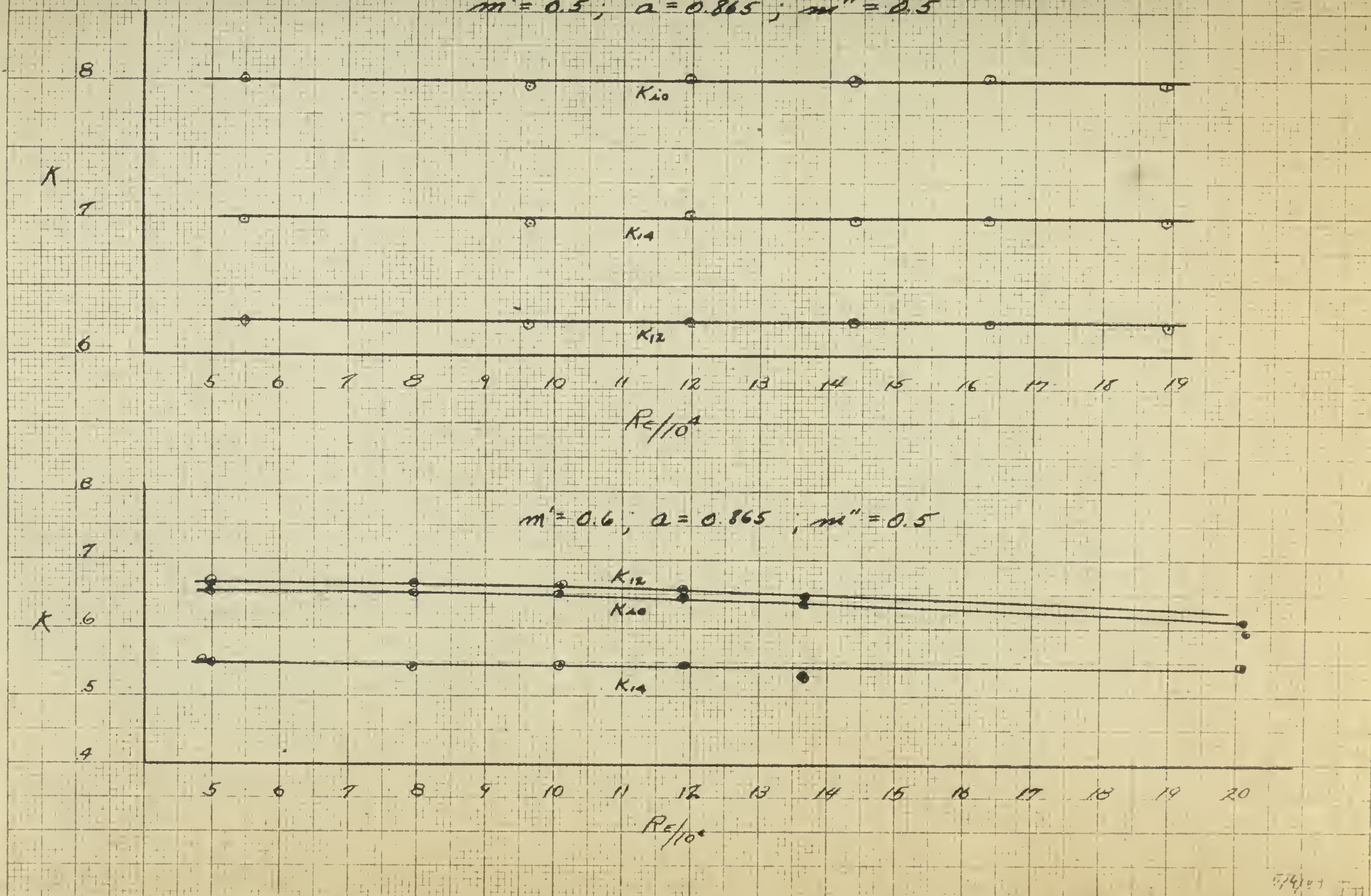
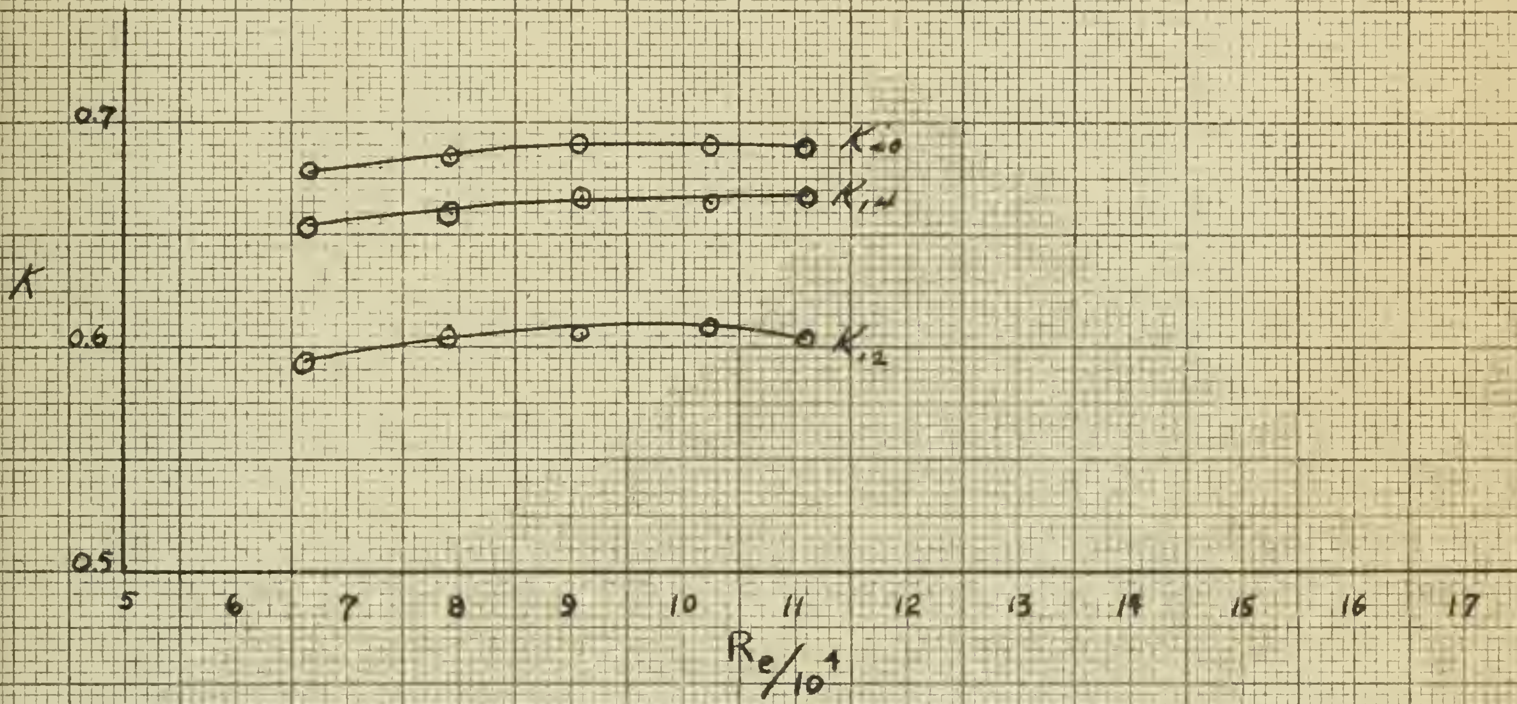


FIGURE VI

DISCHARGE COEFFICIENT K VS REYNOLDS NUMBER R_e.

$m' = 0.3$; $a = 1.423$; $m'' = 0.5$



$m' = 0.4$; $a = 1.423$; $m'' = 0.5$

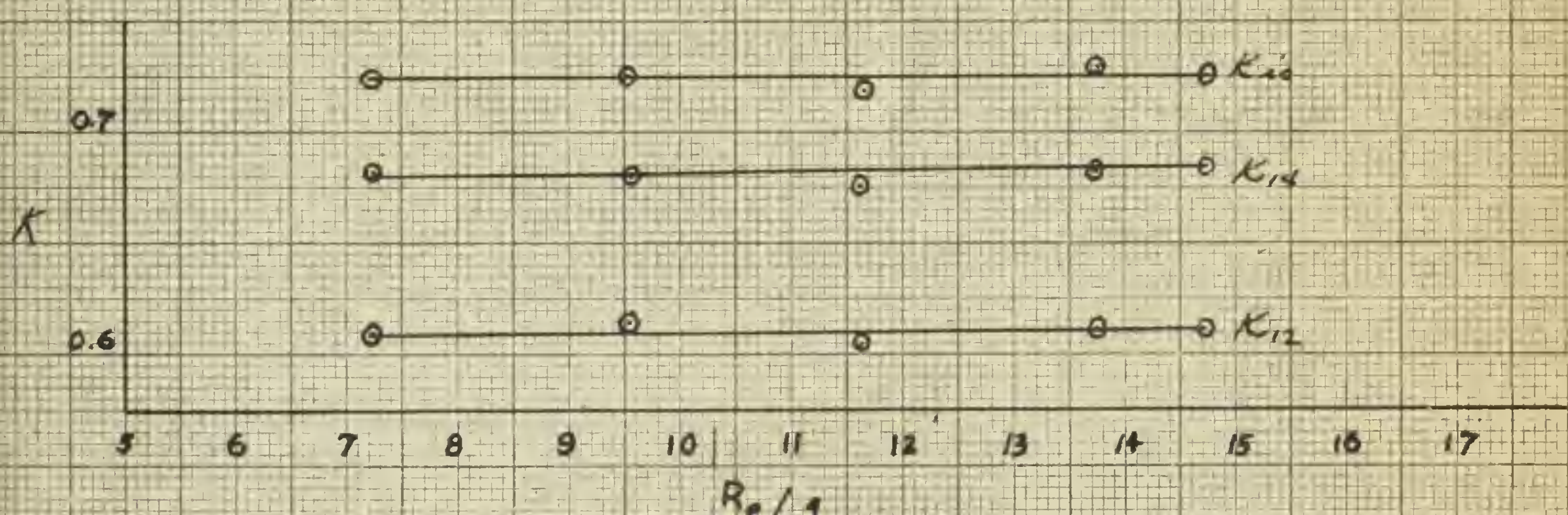
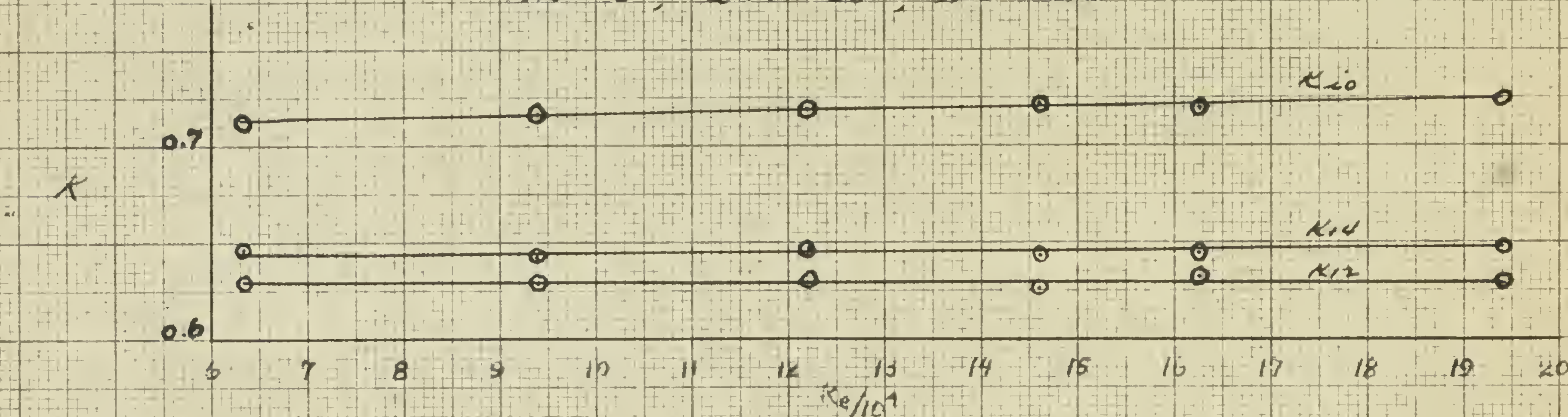


FIGURE VII

DISCHARGE COEFFICIENT K VS. REYNOLDS NO. Re.

$m' = 5$; $a = 1.423$; $m'' = 0.5$



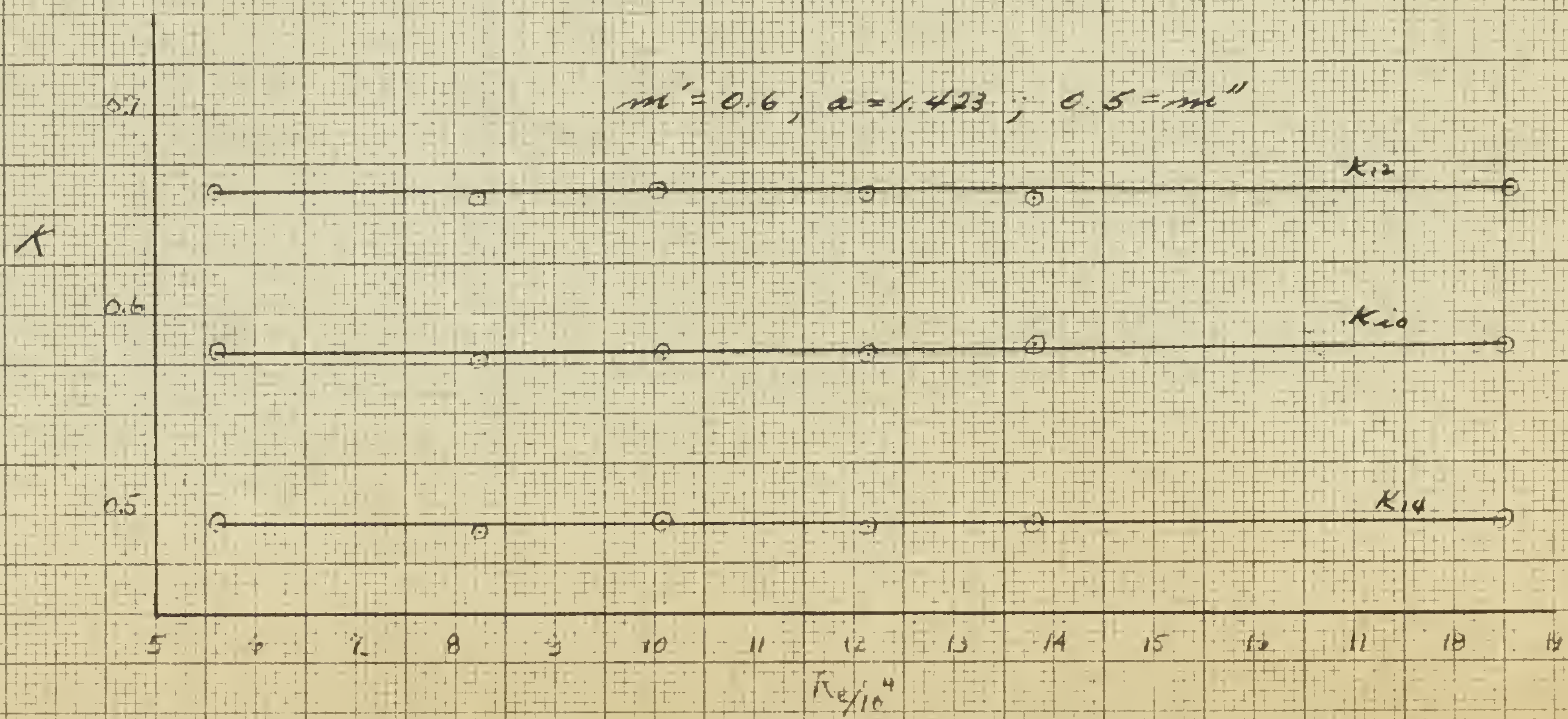


FIGURE VIII

DISCHARGE COEFFICIENT K vs. REYNOLDS NO. RE

$m' = 0.7$; $a = 1.423$; $m'' = 0.5$

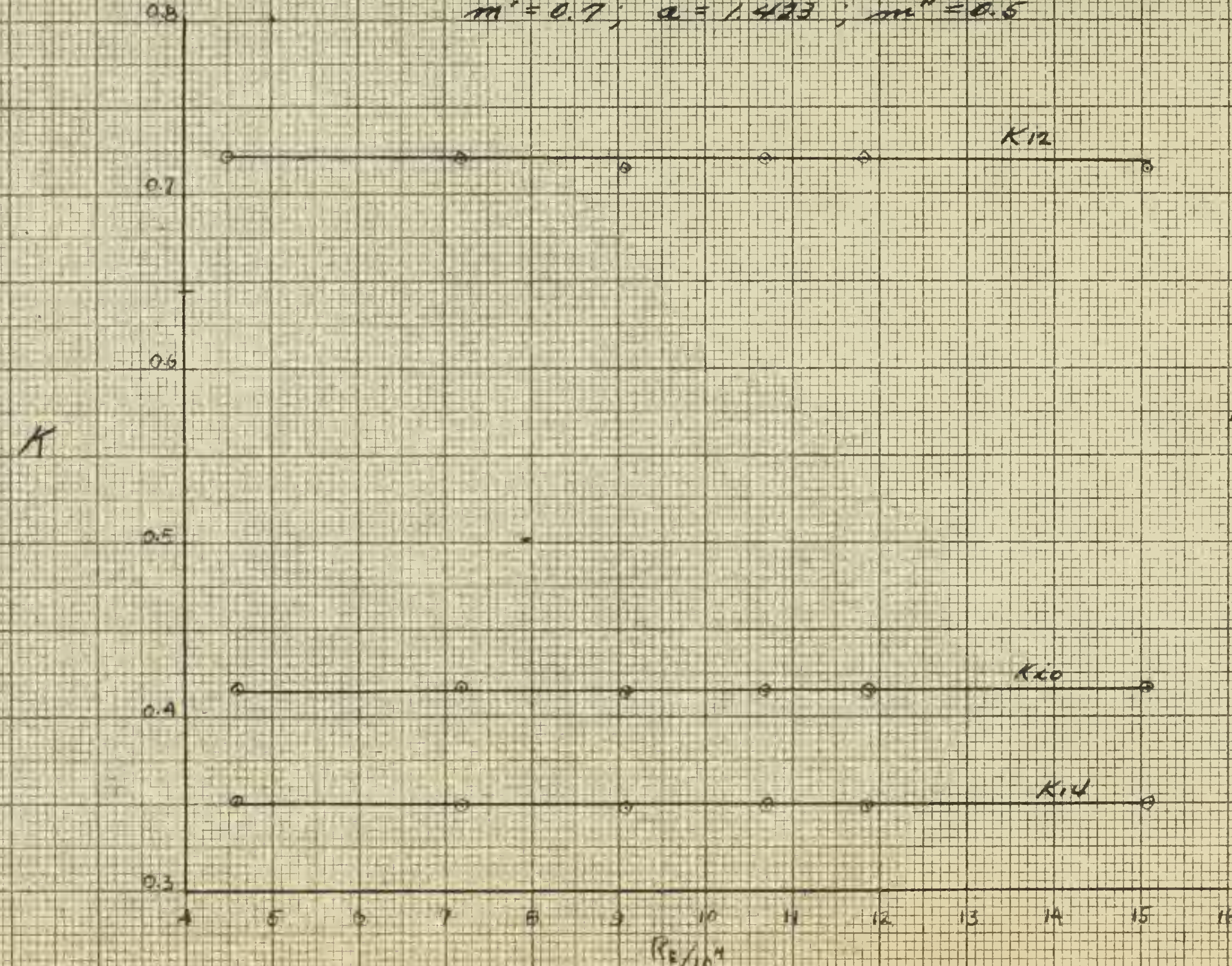
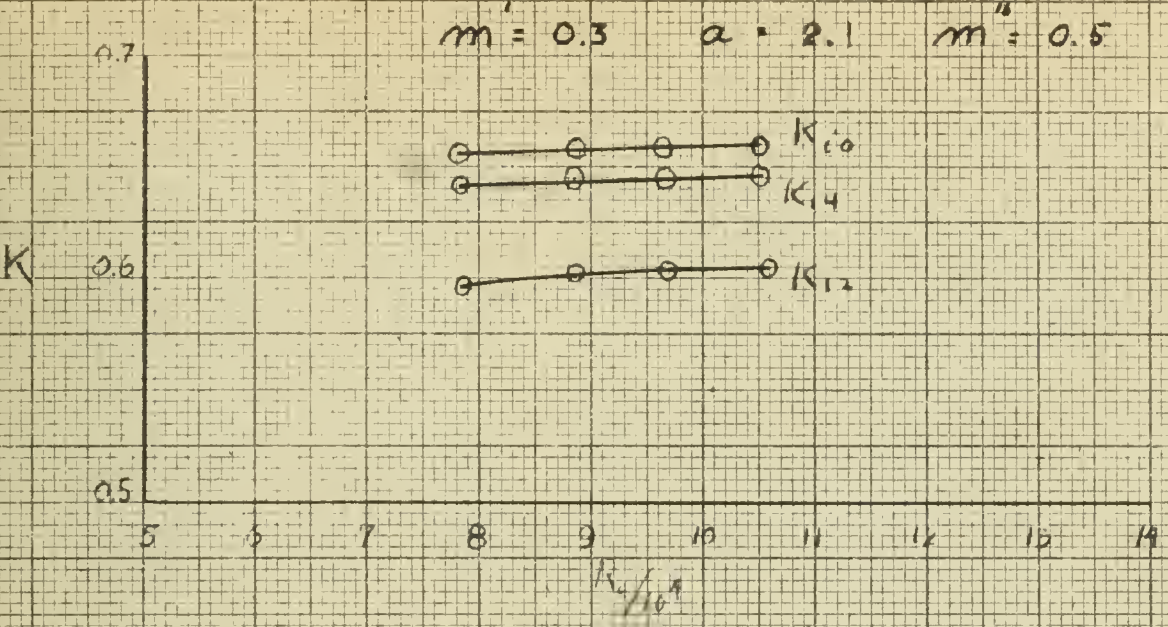
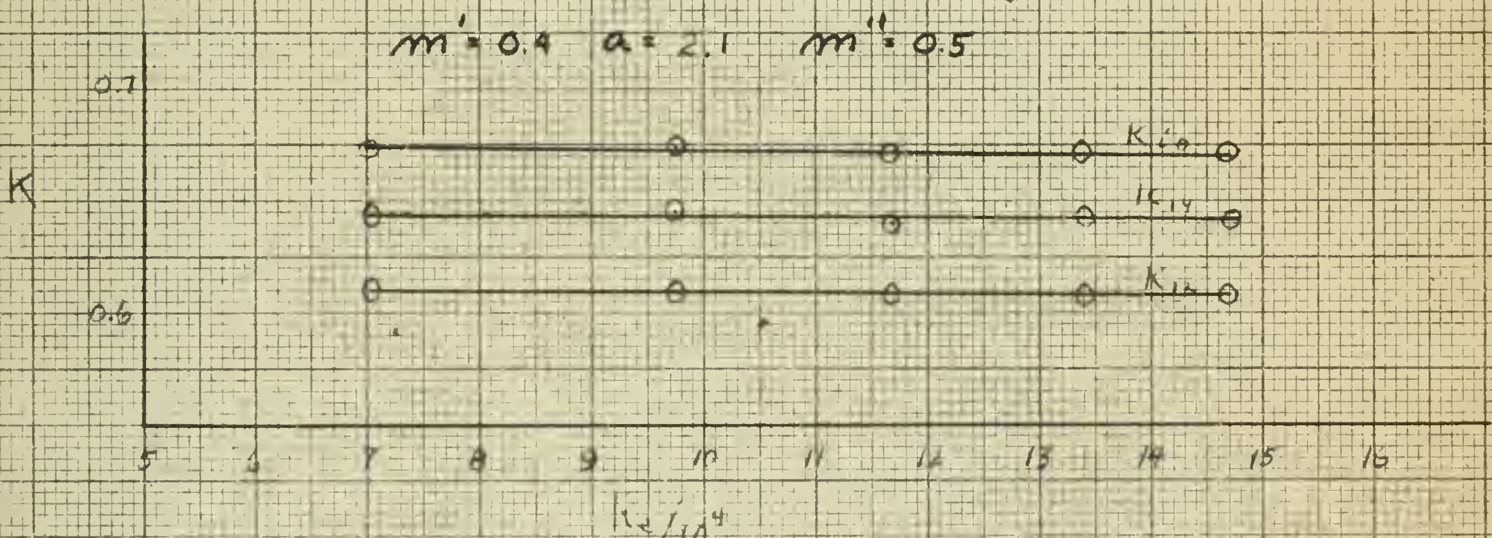


FIGURE IX

DISCHARGE COEFFICIENT K vs. REYNOLDS NUMBER Re





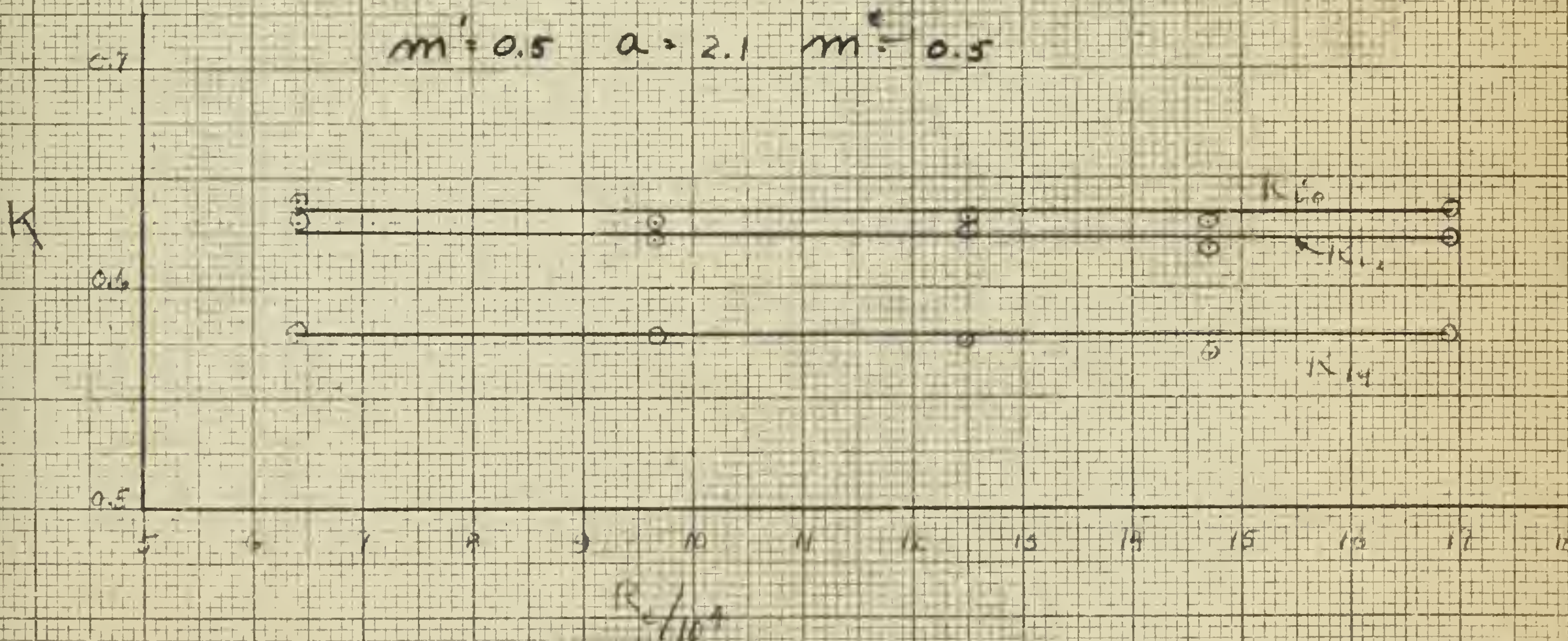
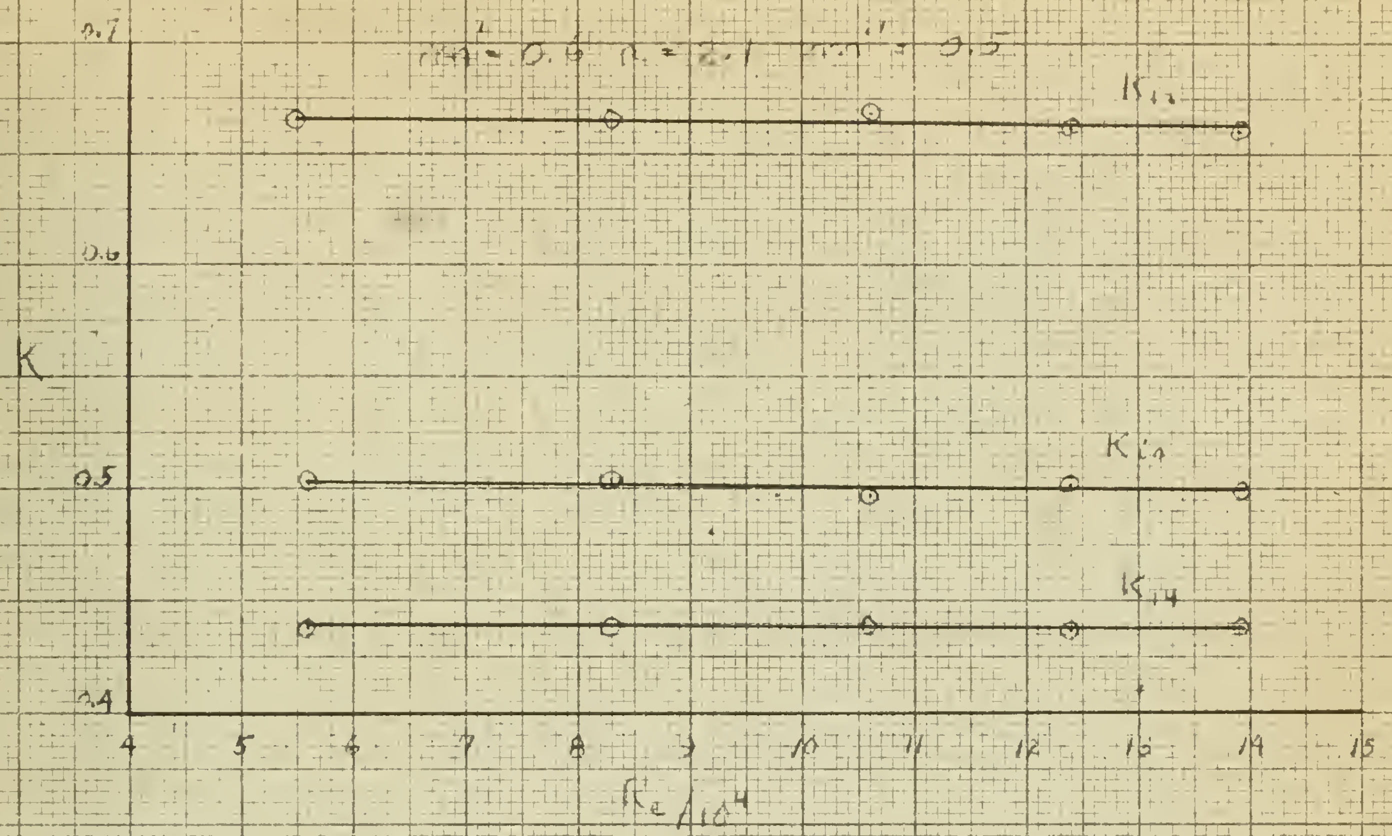


FIGURE X

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER R_E



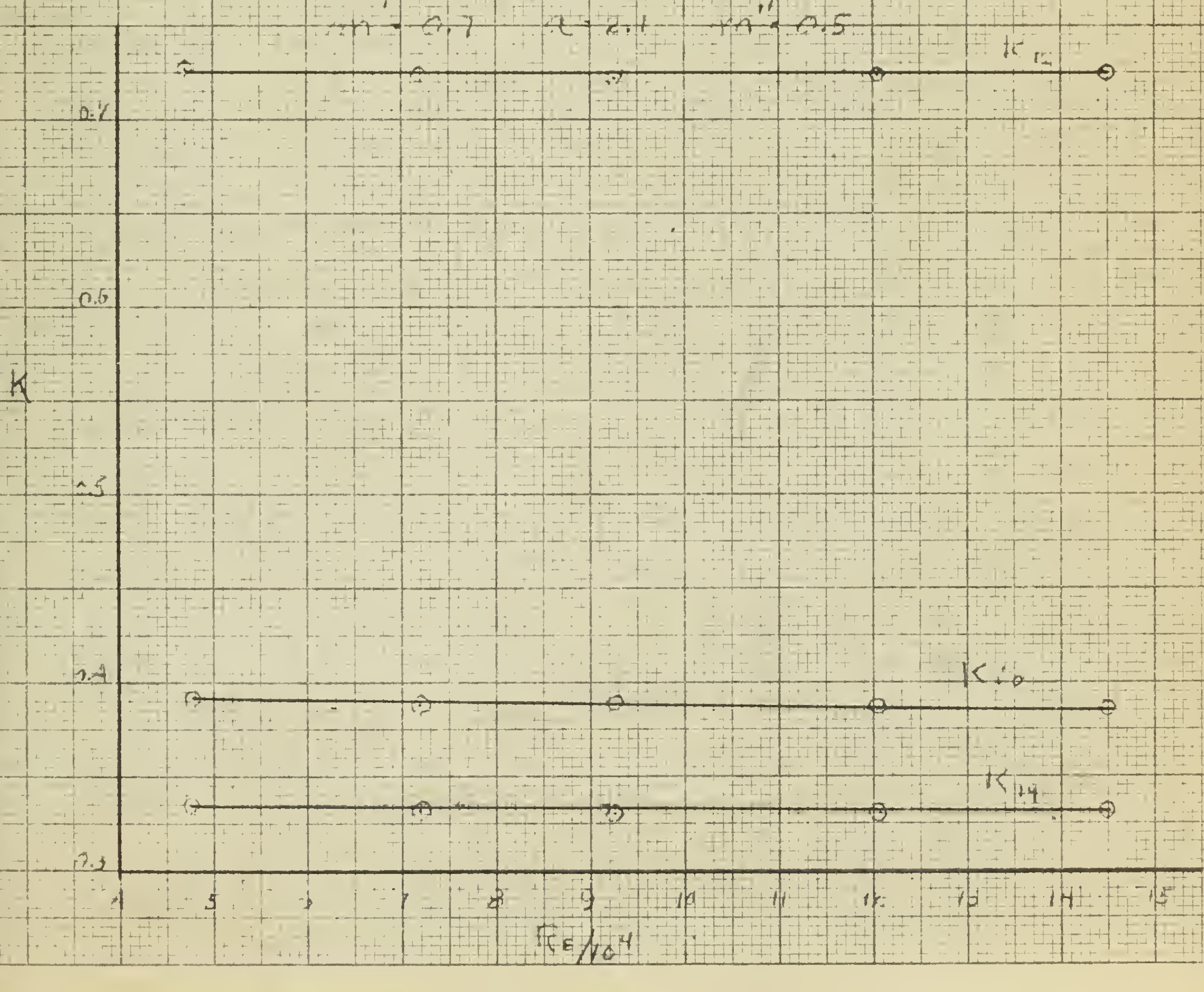


FIGURE XI

DISCHARGE COEFFICIENT K vs. REYNOLDS NUMBER R_e

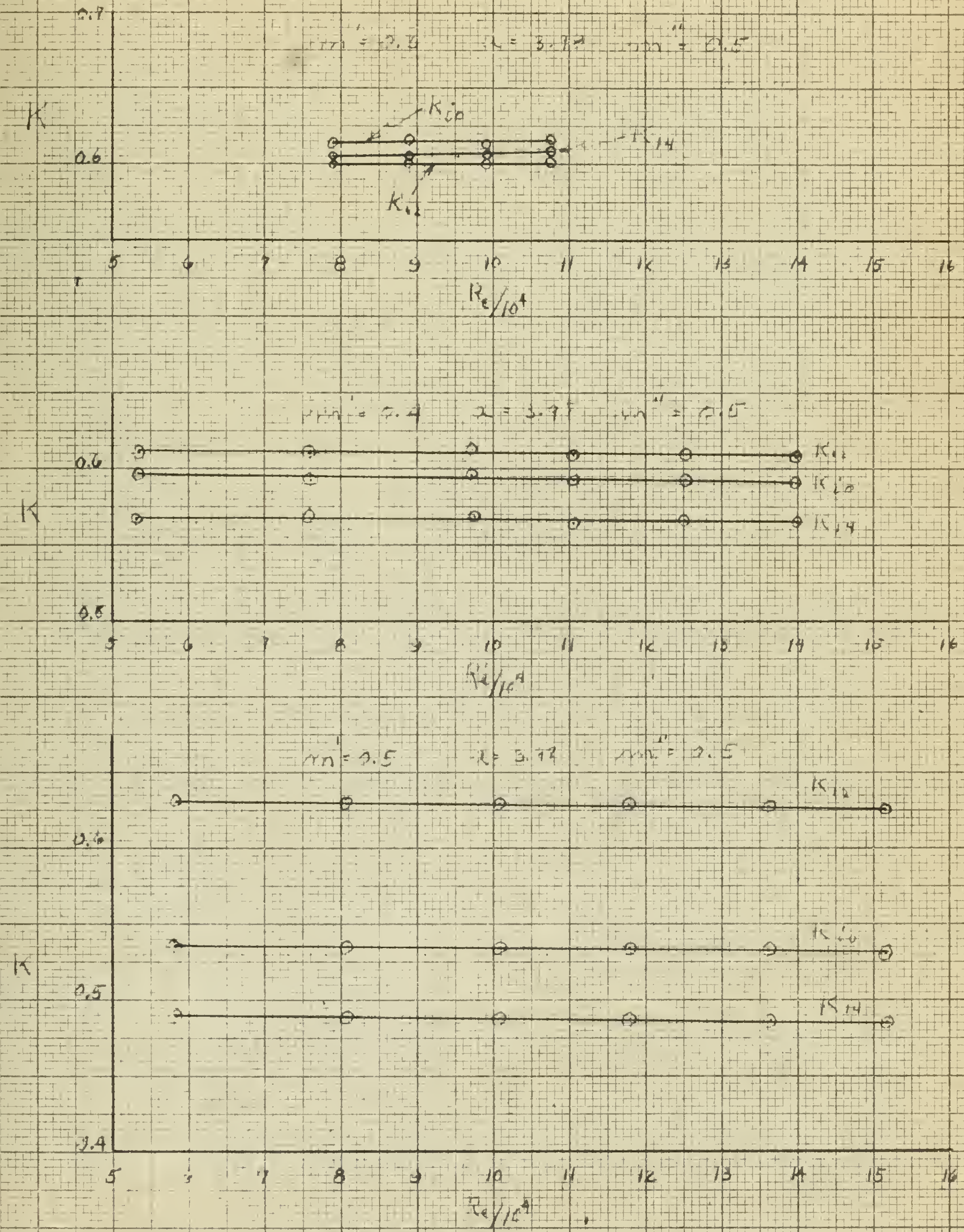


FIGURE XII

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER R_E

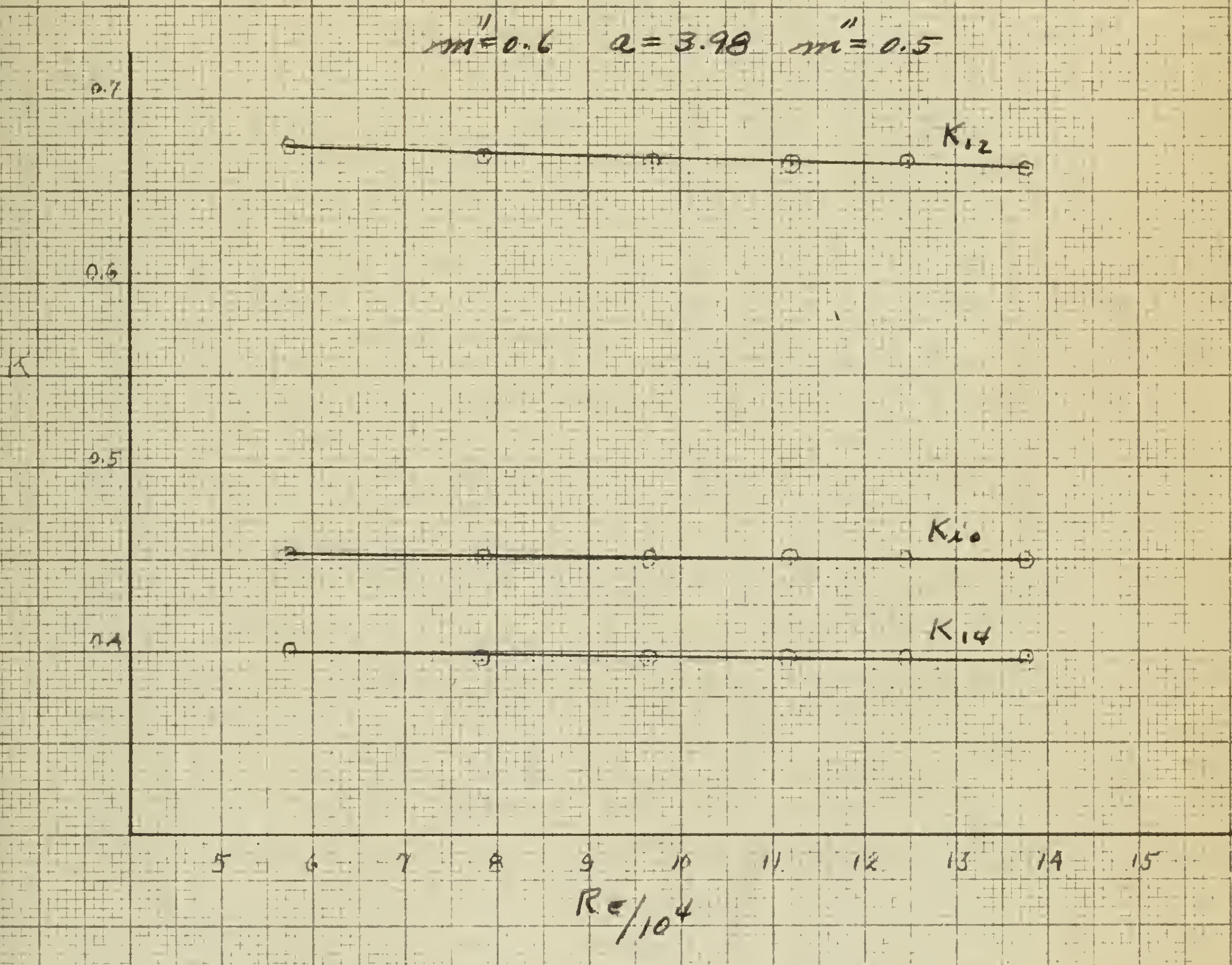


FIGURE XIII

DISCHARGE COEFFICIENT K VS REYNOLDS NUMBER R_E

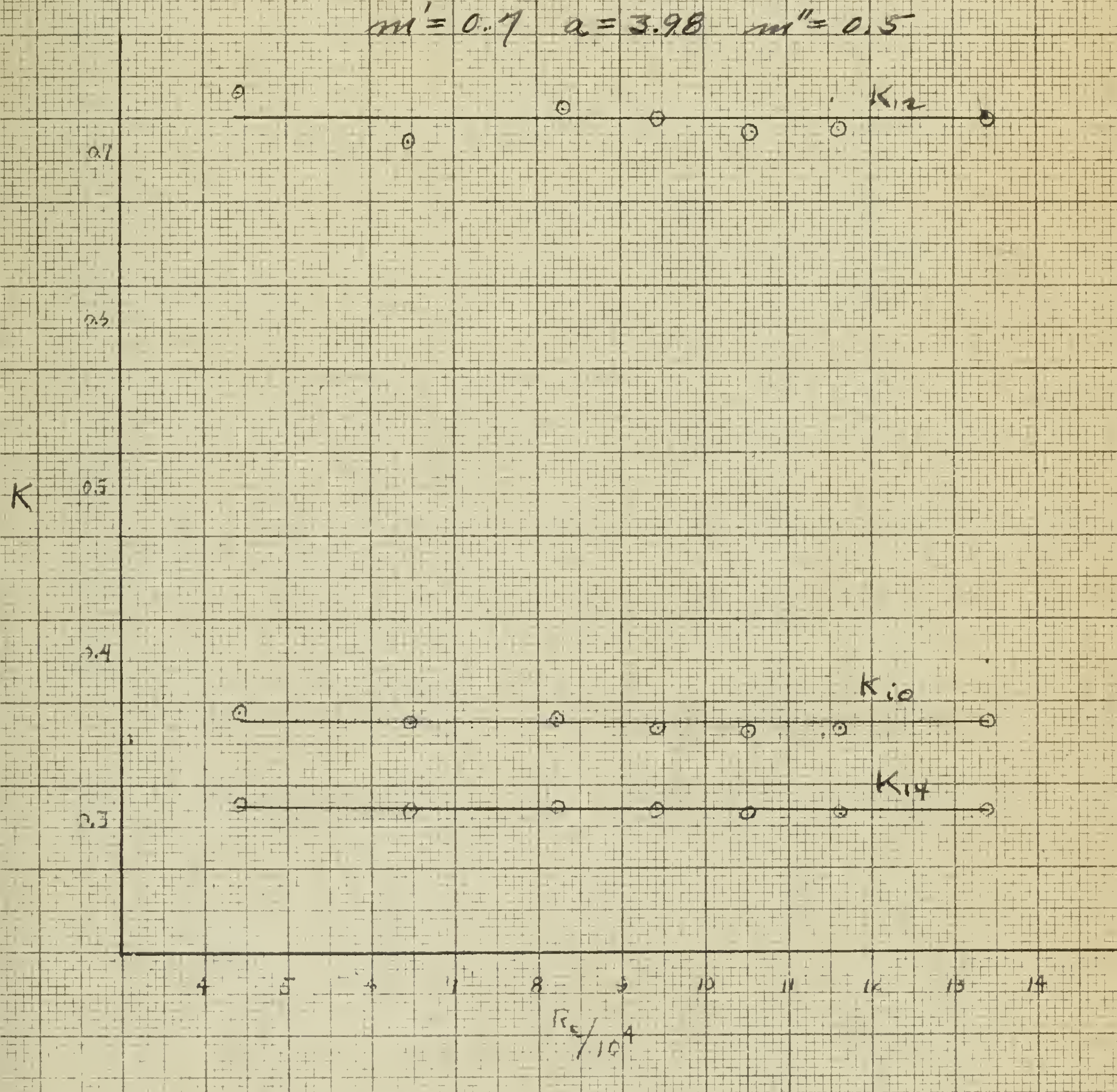
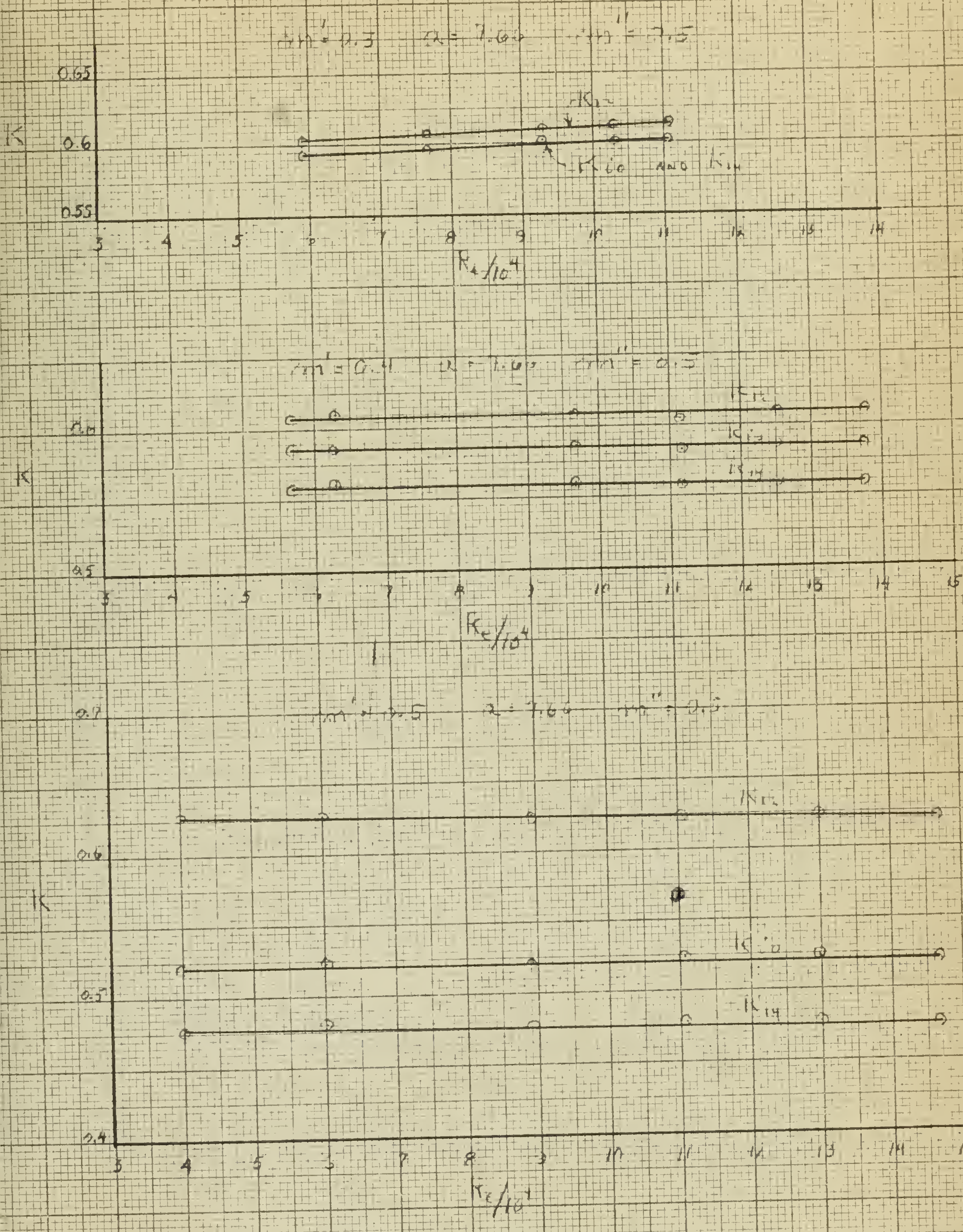


FIGURE XIV

DISCHARGE COEFFICIENT K vs REYNOLDS NUMBER R_e



-[1]/[4]/[4]7

FIGURE XV

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER R_E

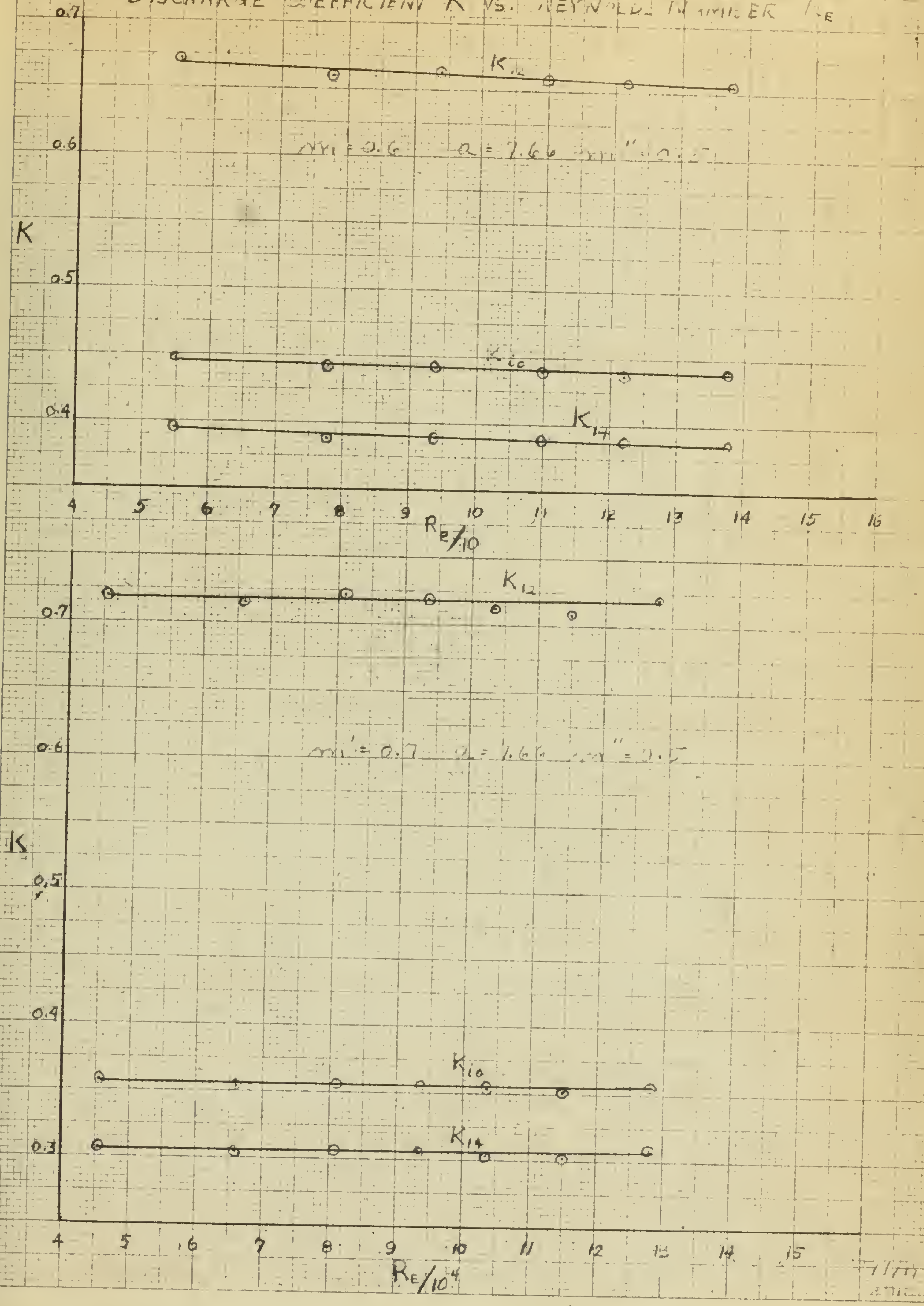


FIGURE XVI

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER R_E.

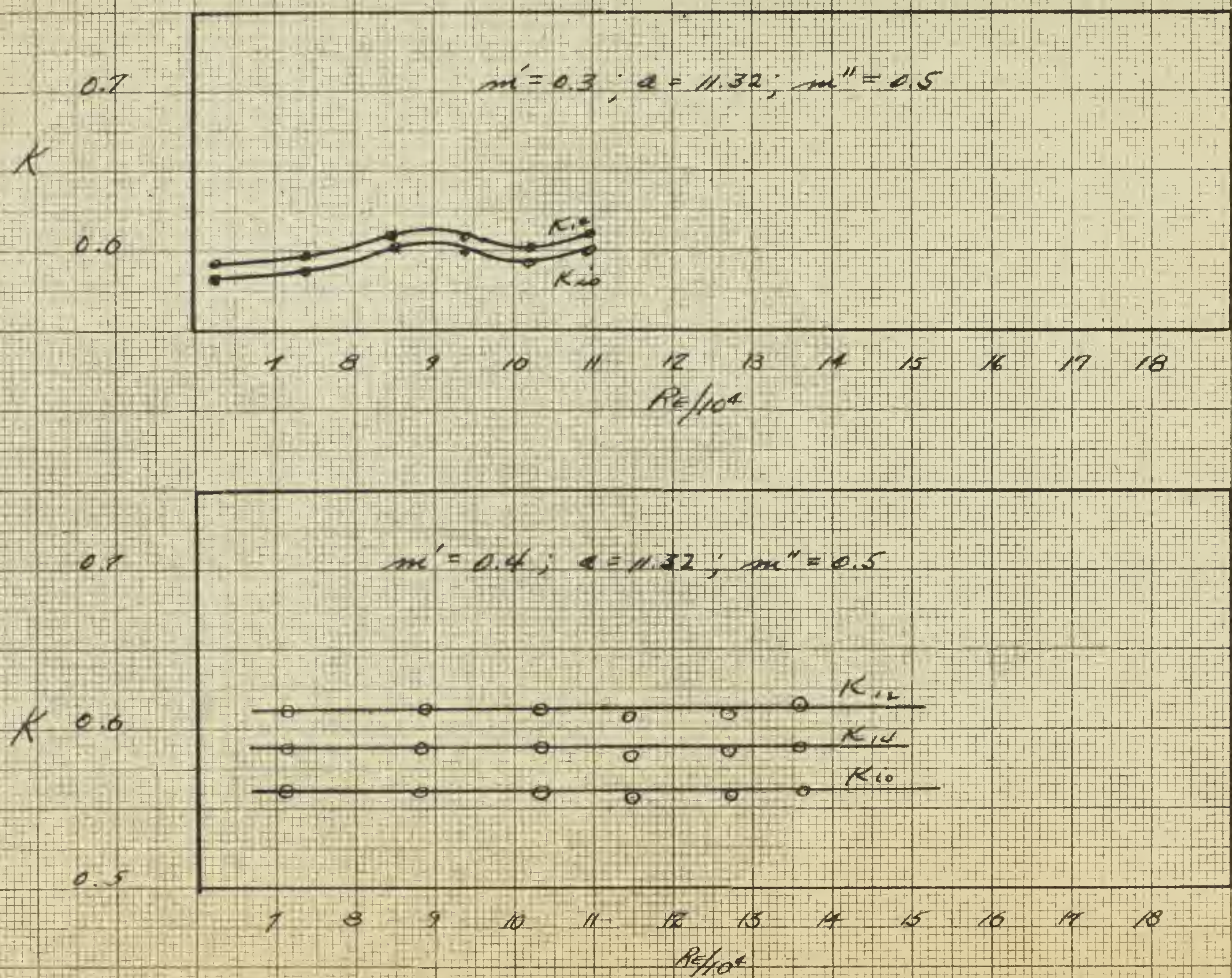
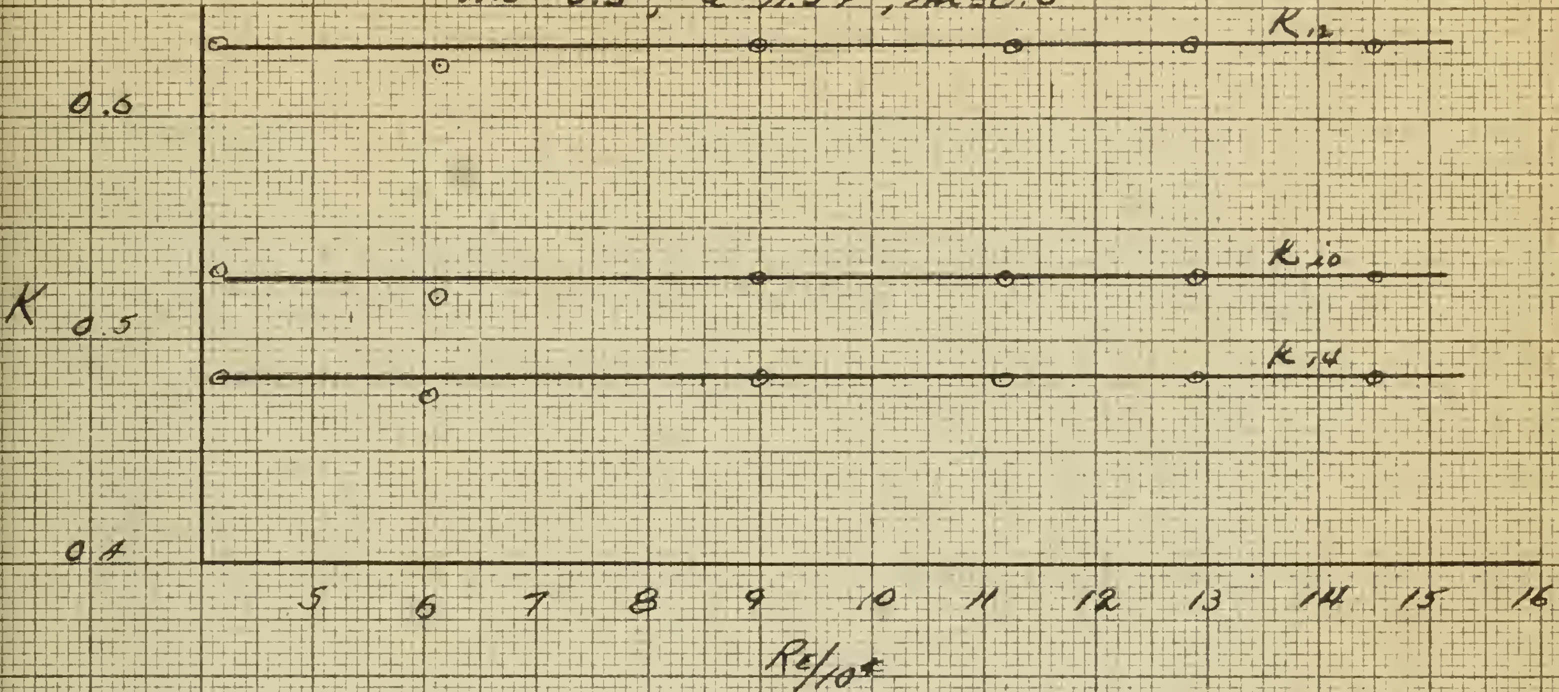


FIGURE XVII

DISCHARGE COEFFIENT K VS. REYNOLDS NUMBER RE

$m' = 0.5$; $a = 11.34$; $m'' = 0.5$



$m' = 0.6$; $a = 11.34$; $m'' = 0.5$

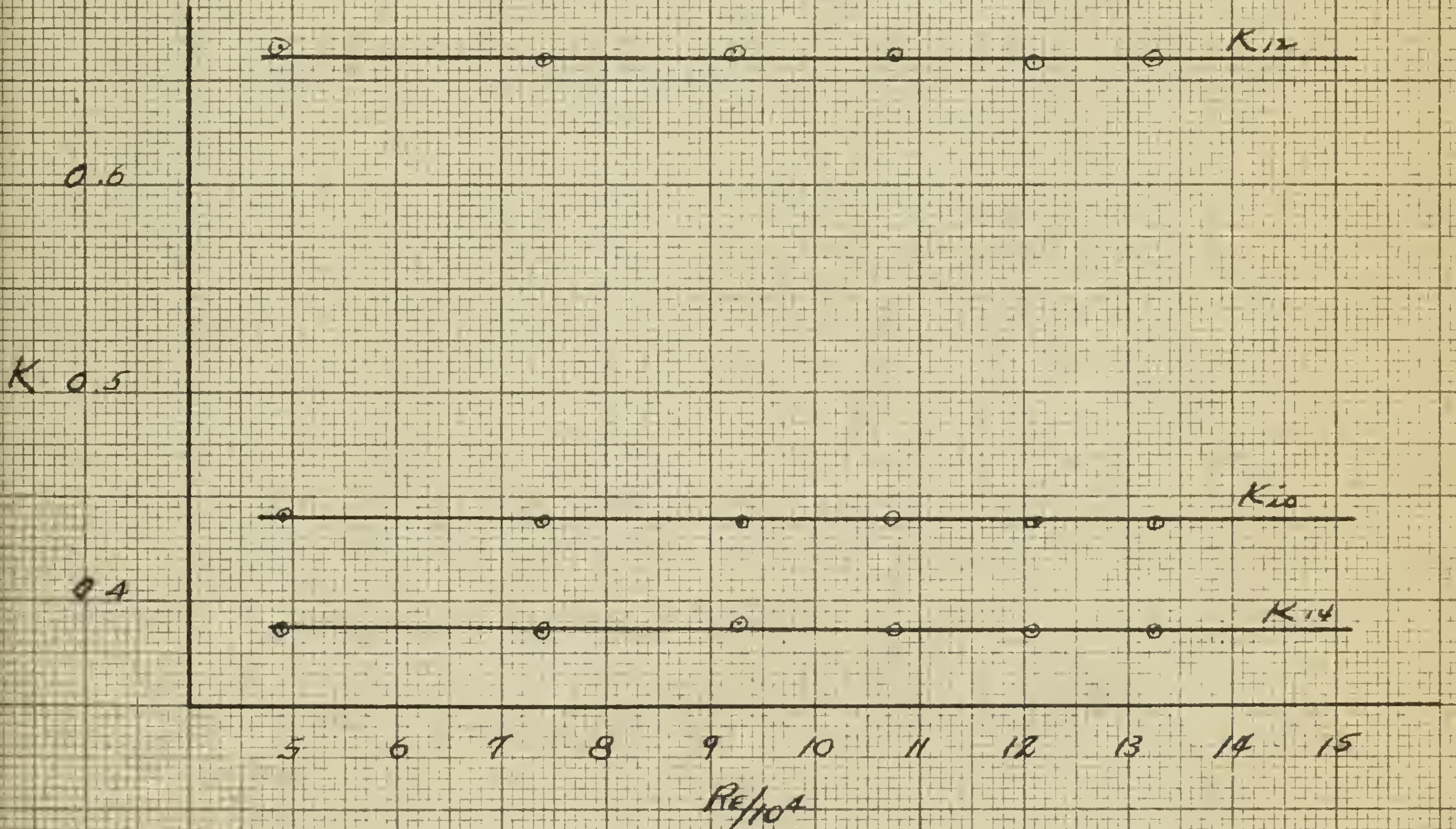


FIGURE XVIII

DISCHARGE COEFFIENT K VS. REYNOLDS NUMBER

$m' = 0.7$; $a = 11.34$; $m'' = 0.5$

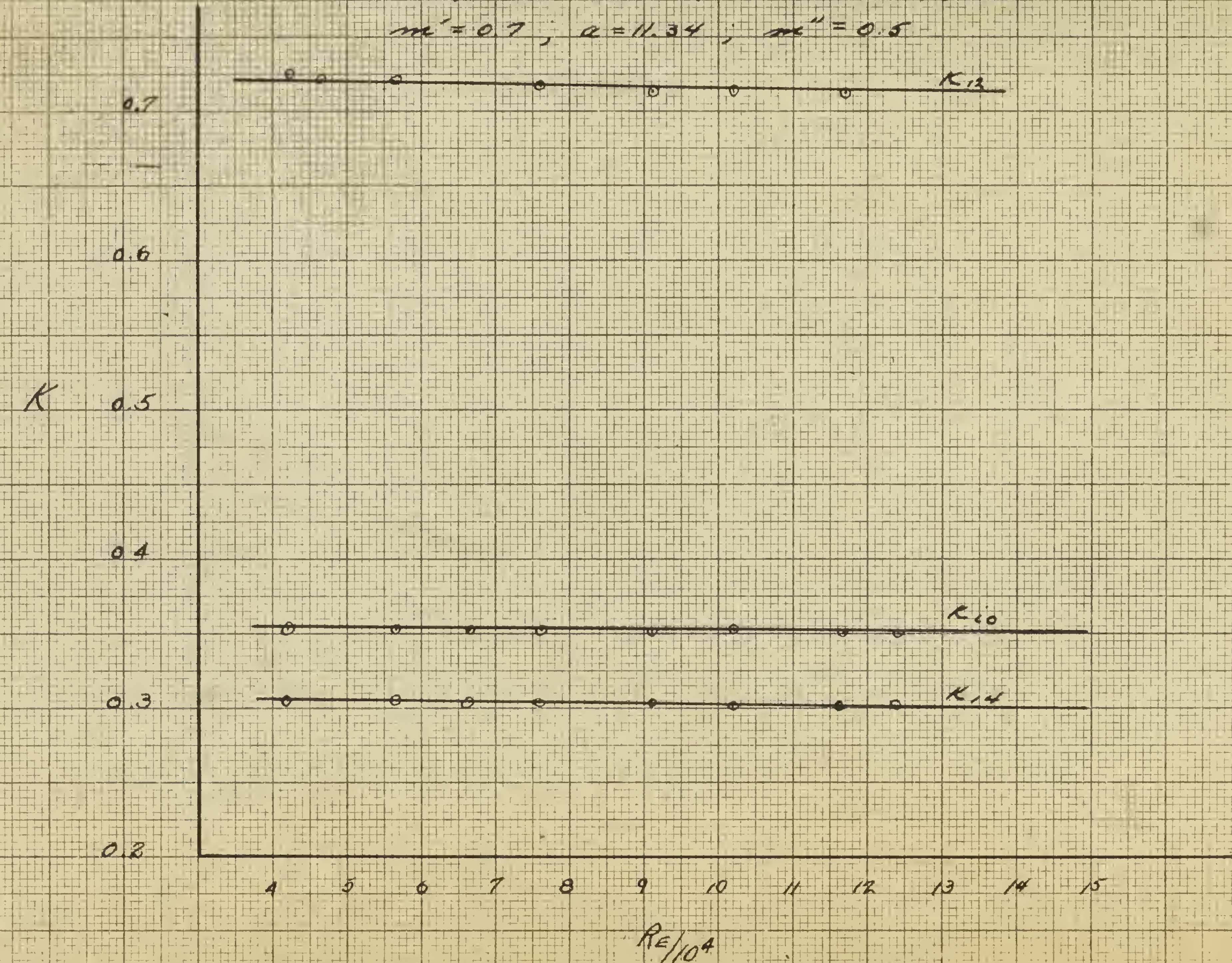


FIGURE XIX

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER R_e

$m' = 0.3$; $a = 0.865$; $m'' = 0.6$

$m' = 0.4$; $a = 0.865$; $m'' = 0.6$

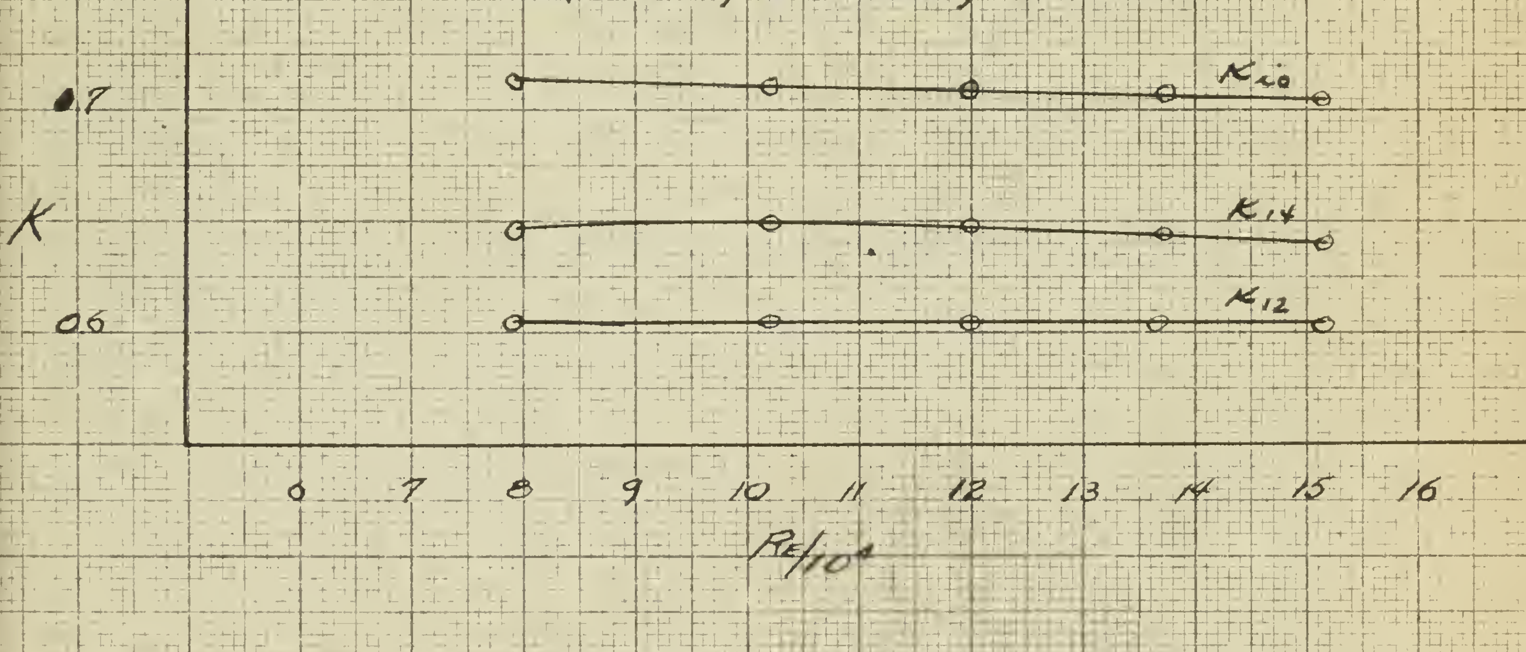


FIGURE XX

DISCHARGE COEFFICIENT K vs. REYNOLDS NUMBER R_e

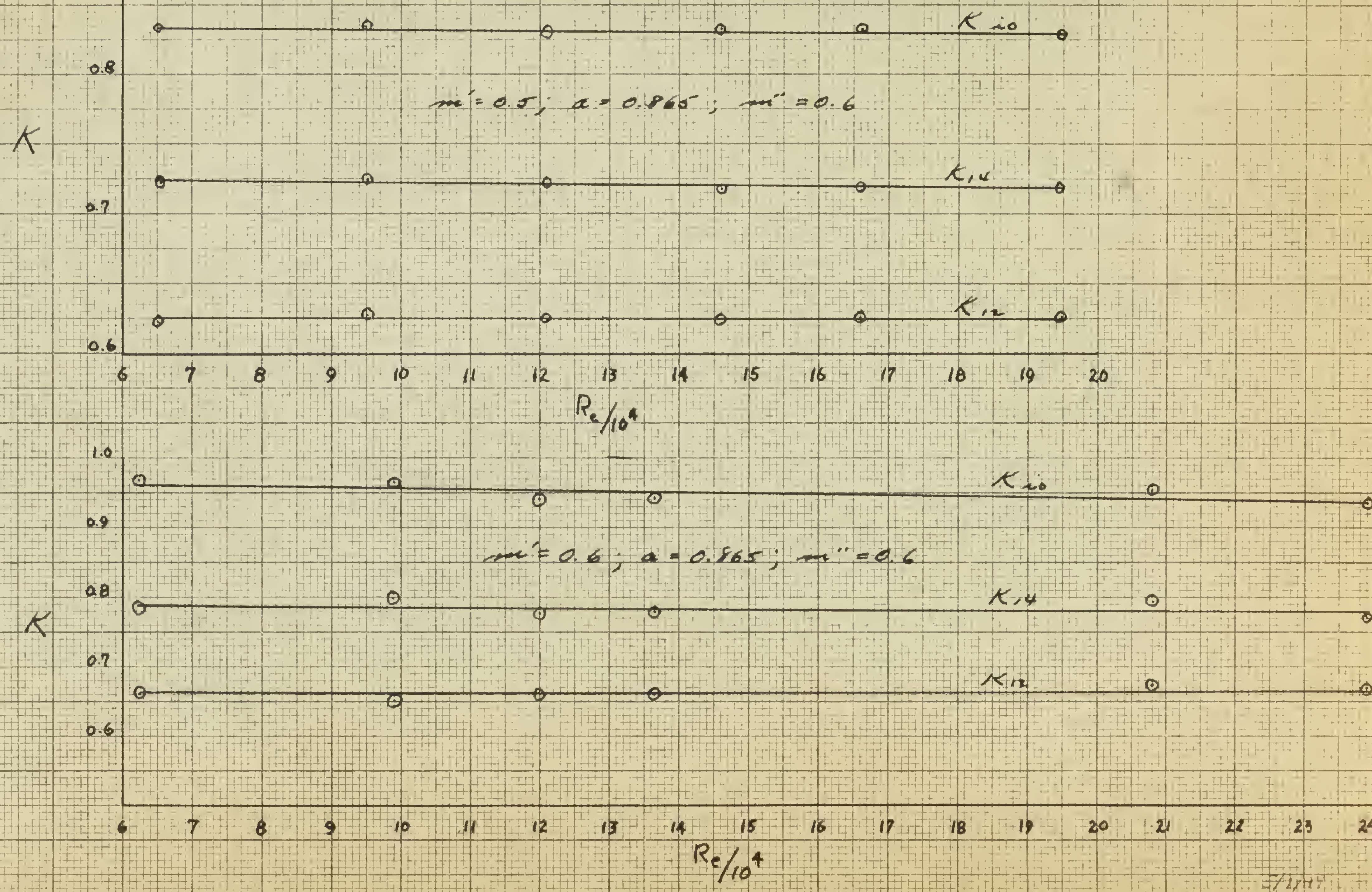
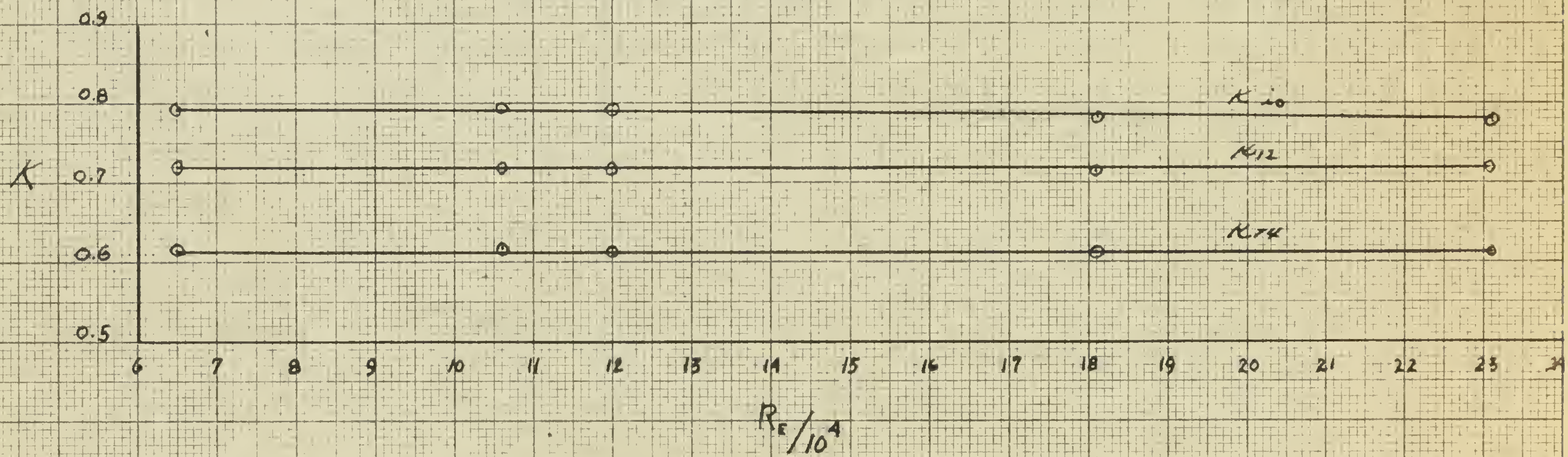


FIGURE XXI

DISCHARGE COEFFICIENT K vs REYNOLDS NUMBER R_E

$m' = 0.7$; $a = 0.865$; $m'' = 0.6$



5/9/47

FIGURE XXII

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER R_E

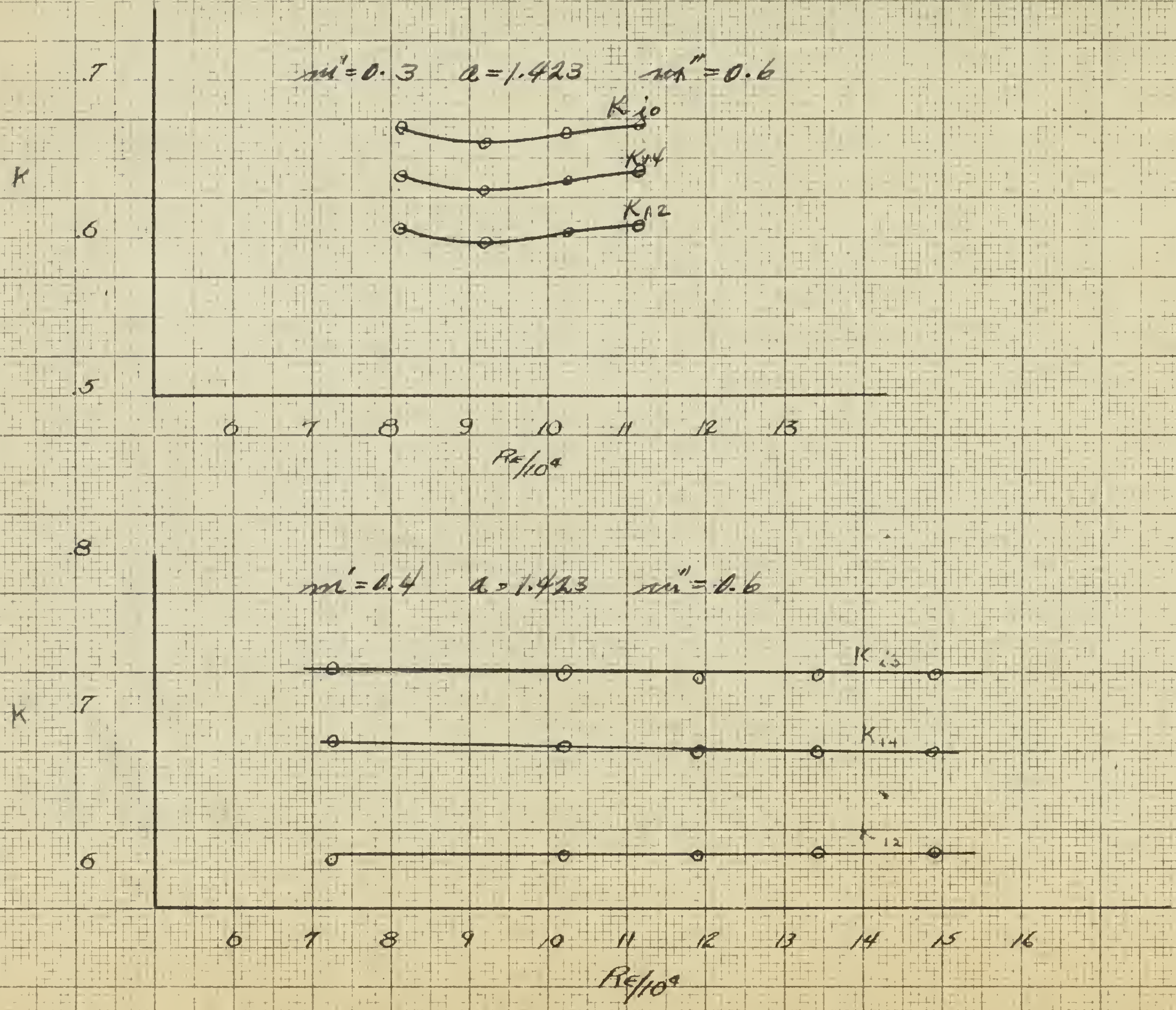


FIGURE XXIII

DISCHARGE COEFFICIENT K vs. REYNOLDS NUMBER R_E

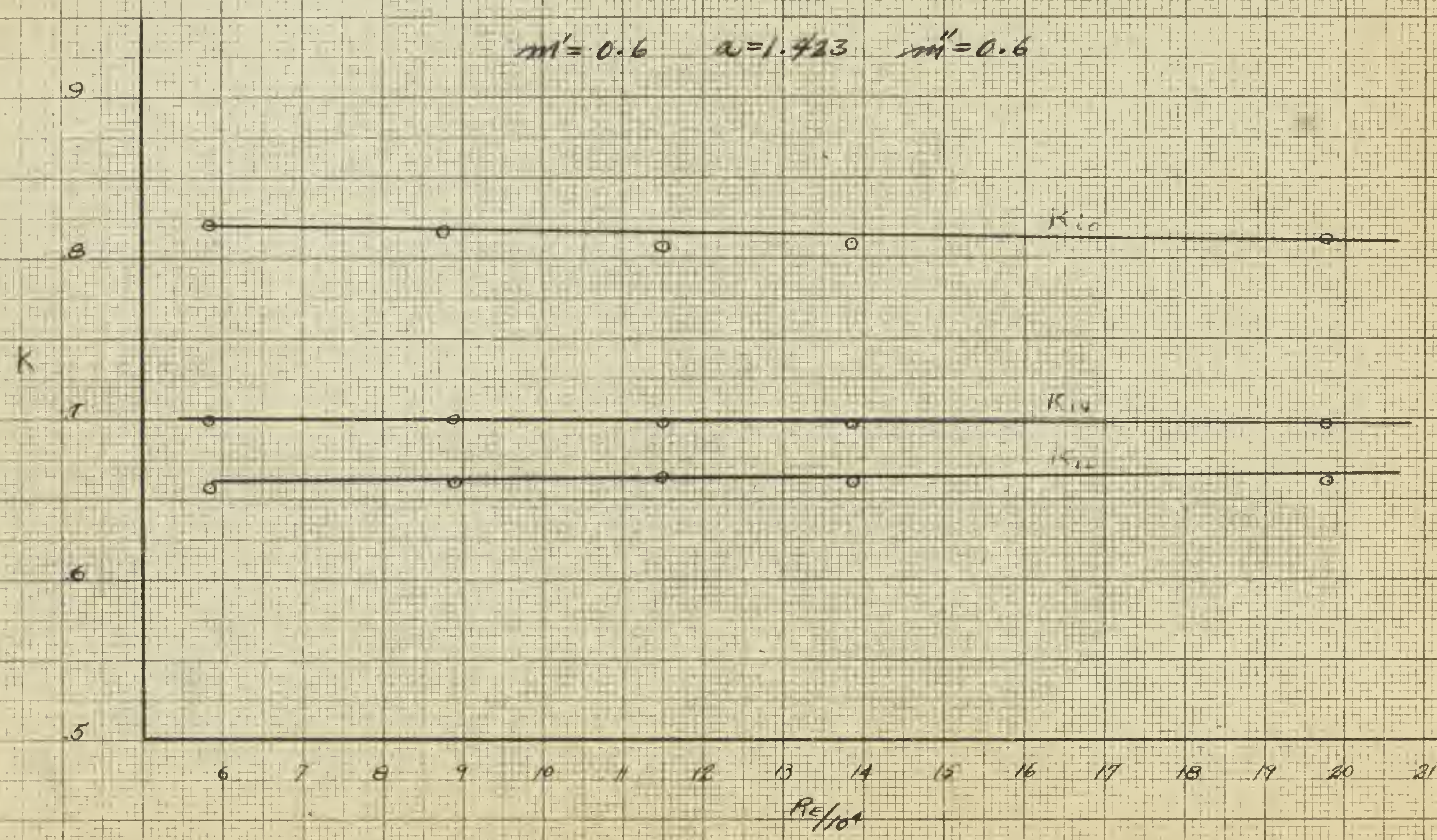


FIGURE XXIV

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER Re

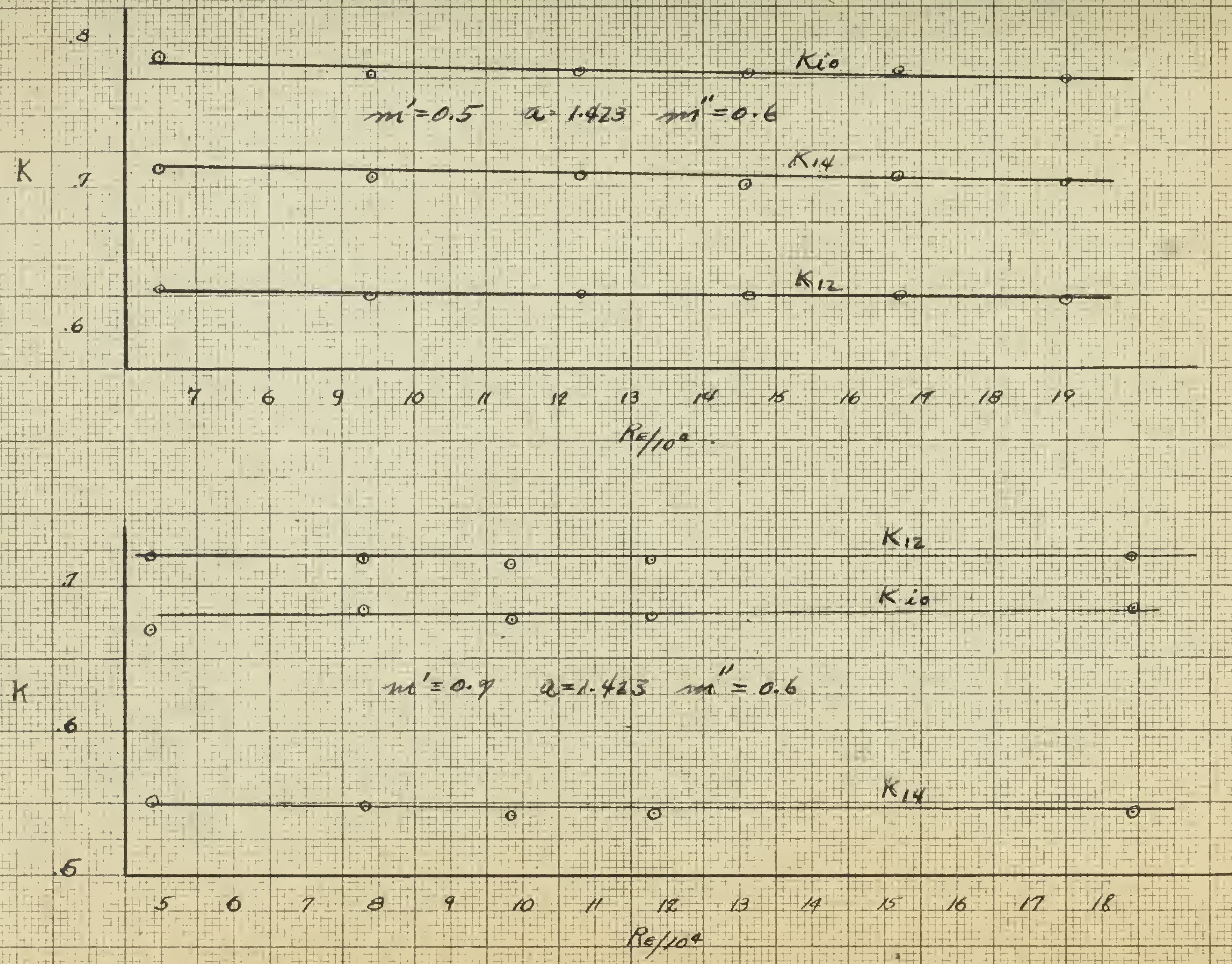
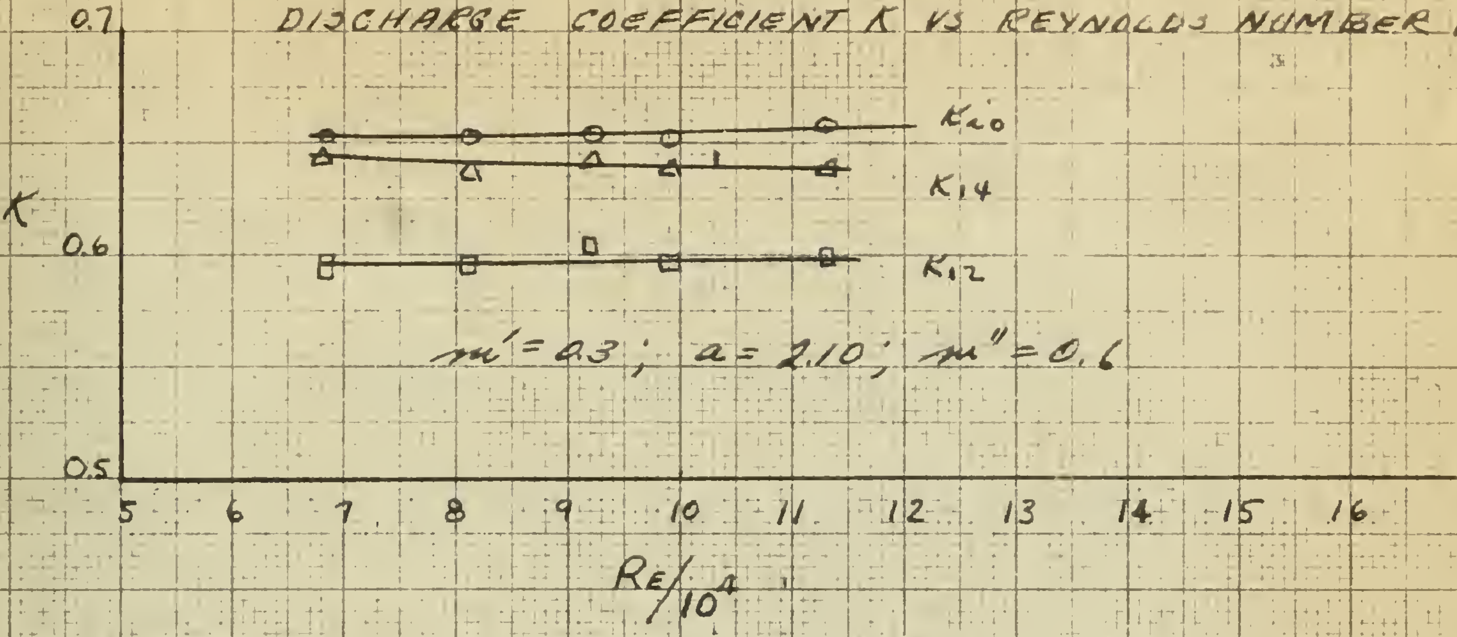
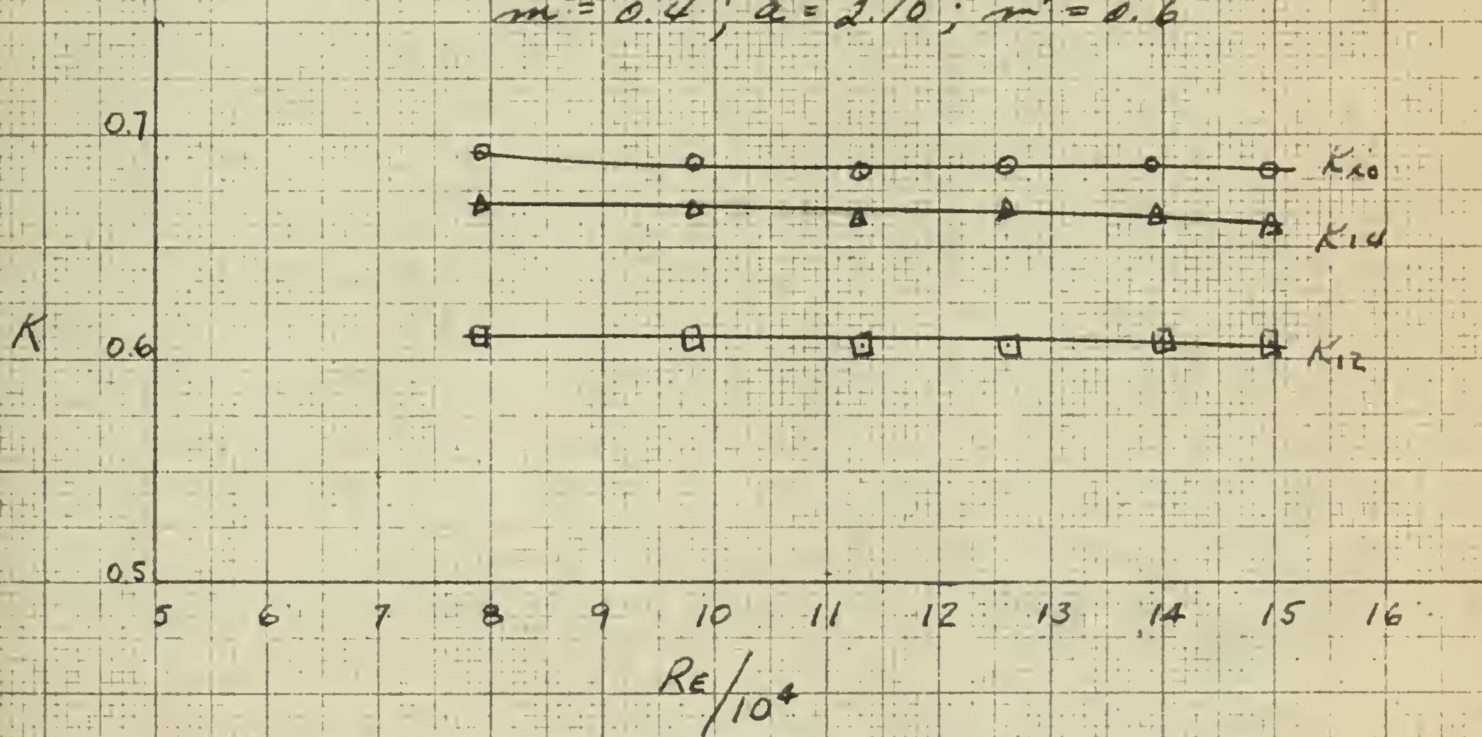


FIGURE XXV

DISCHARGE COEFFICIENT K VS REYNOLDS NUMBER Re





5/7/4

FIGURE XXVI

DISCHARGE COEFFICIENT K vs REYNOLDS NUMBER R_E

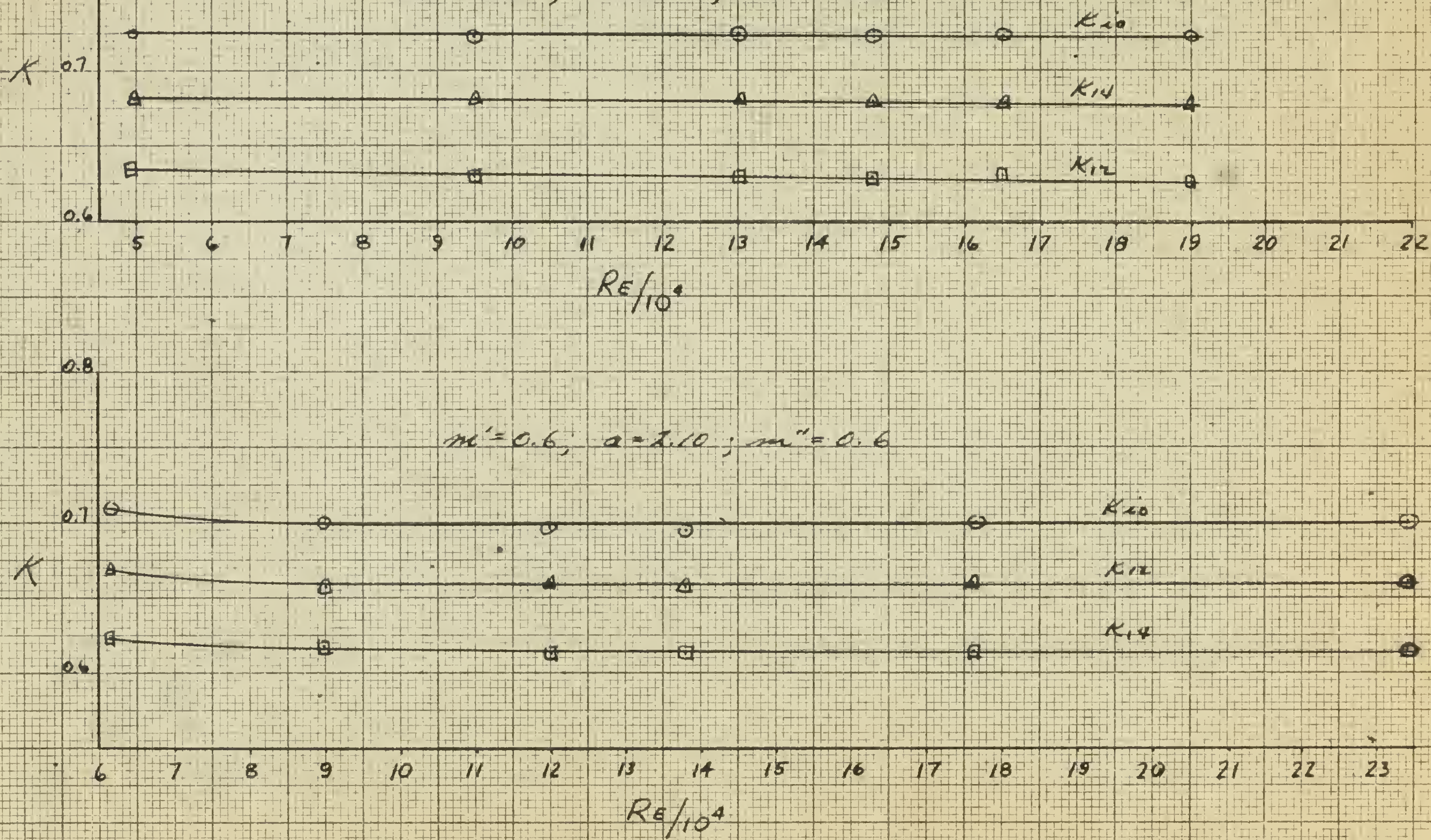


FIGURE XXVII

DISCHARGE COEFFICIENT K VS REYNOLDS NUMBER R_E

$m' = 0.7$; $a = 2.10$; $m'' = 0.6$

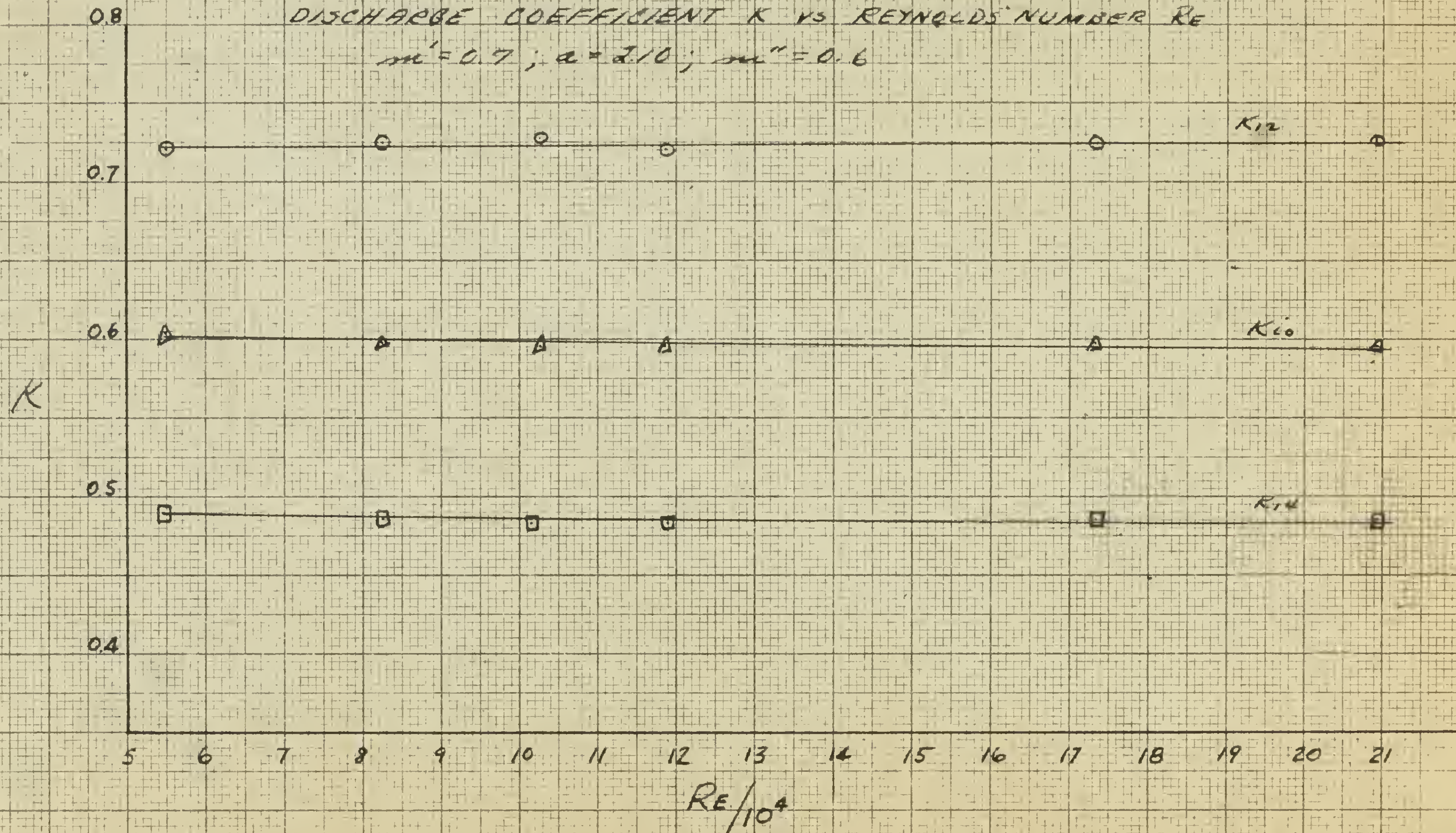


FIGURE XXVIII

DISCHARGE COEFFICIENT K vs. REYNOLDS NUMBER R_E

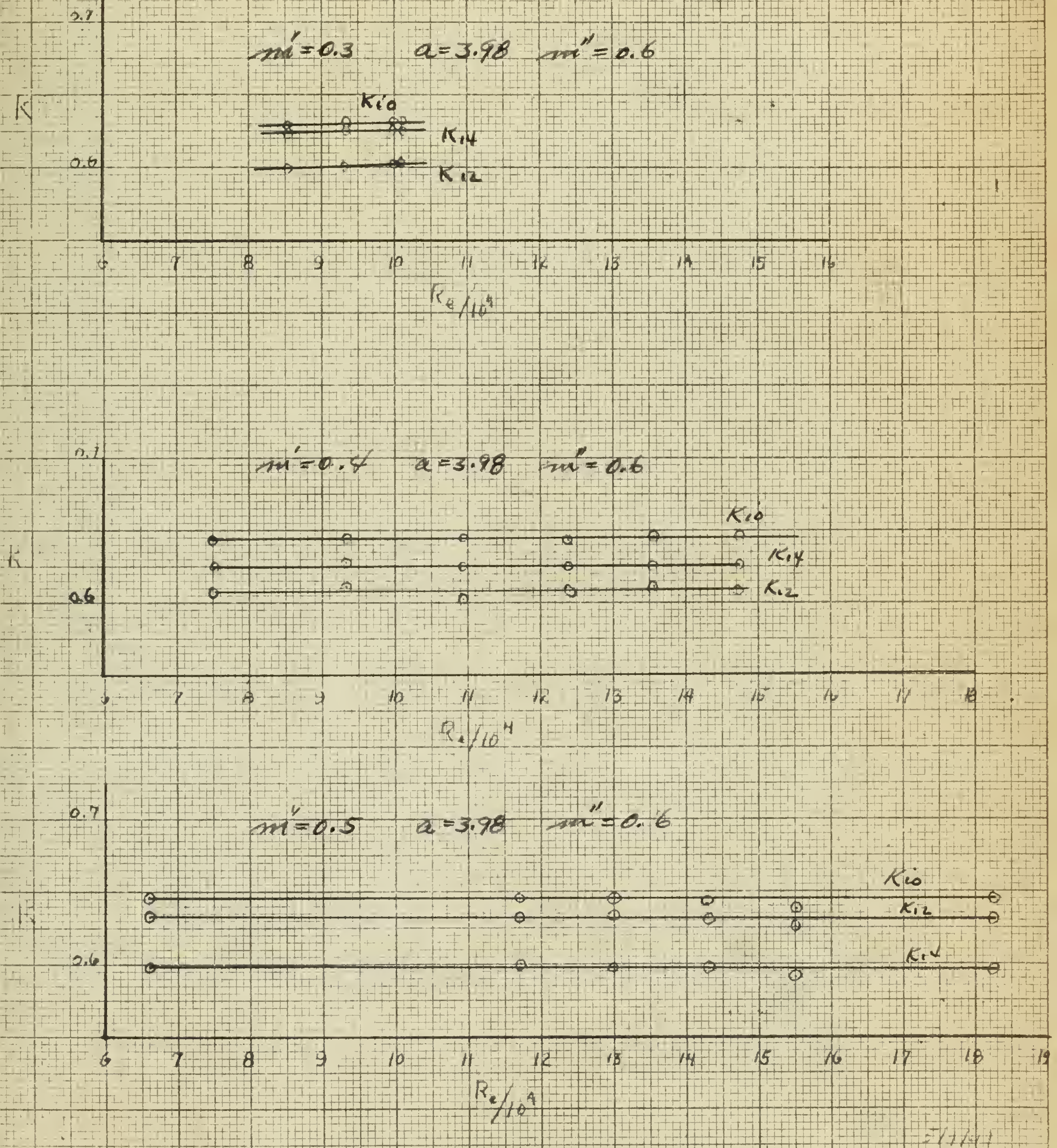
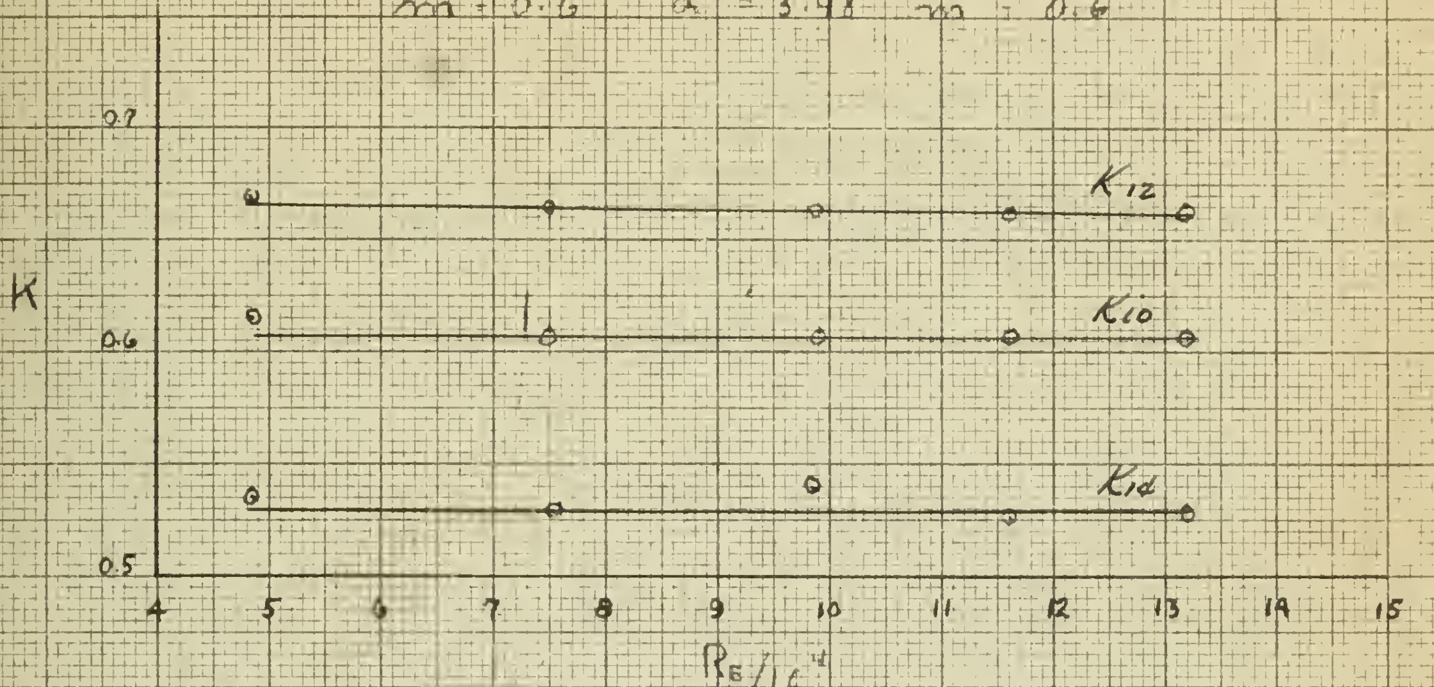


FIGURE XXIX

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER RE



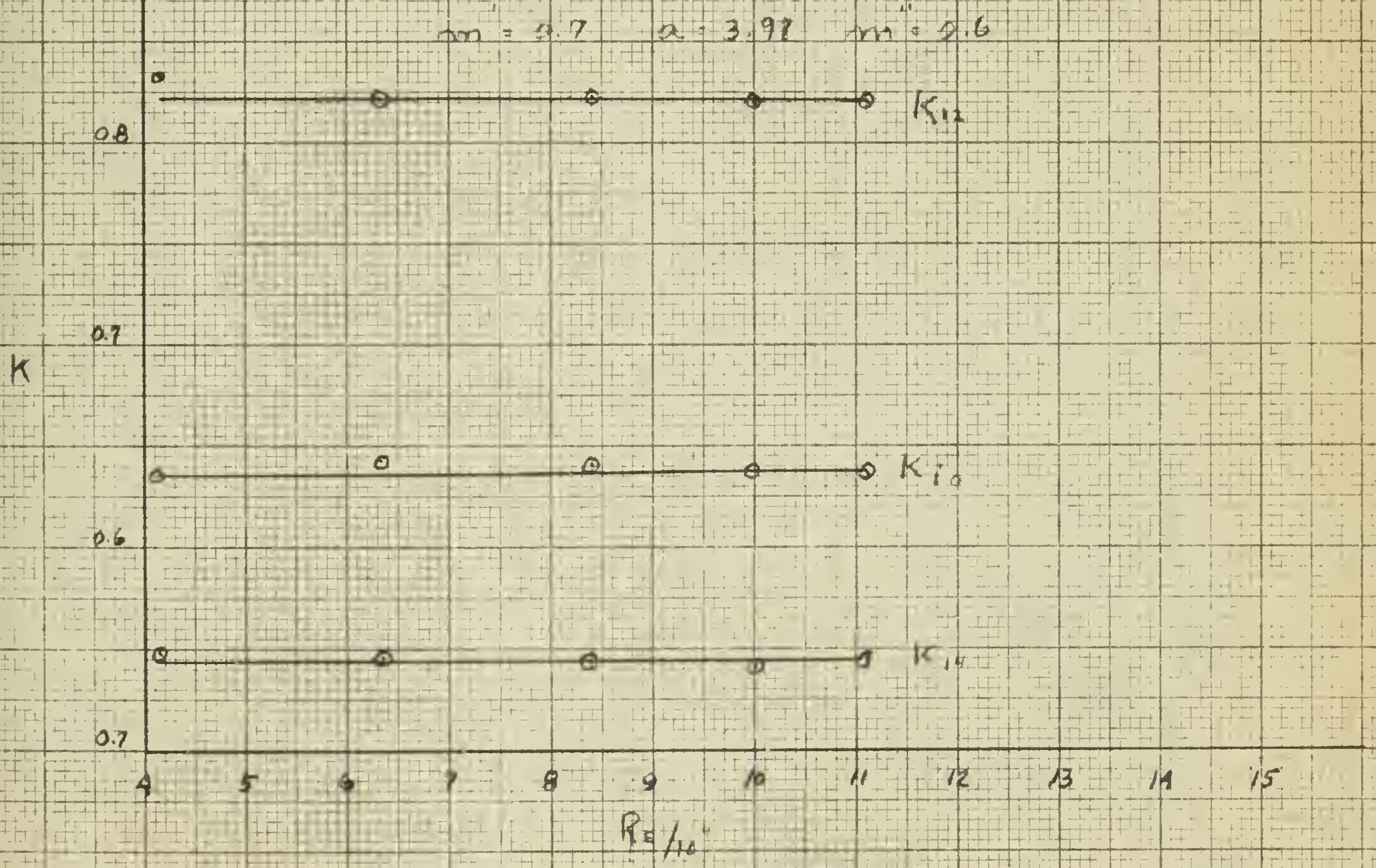


FIGURE XXX

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER R_E

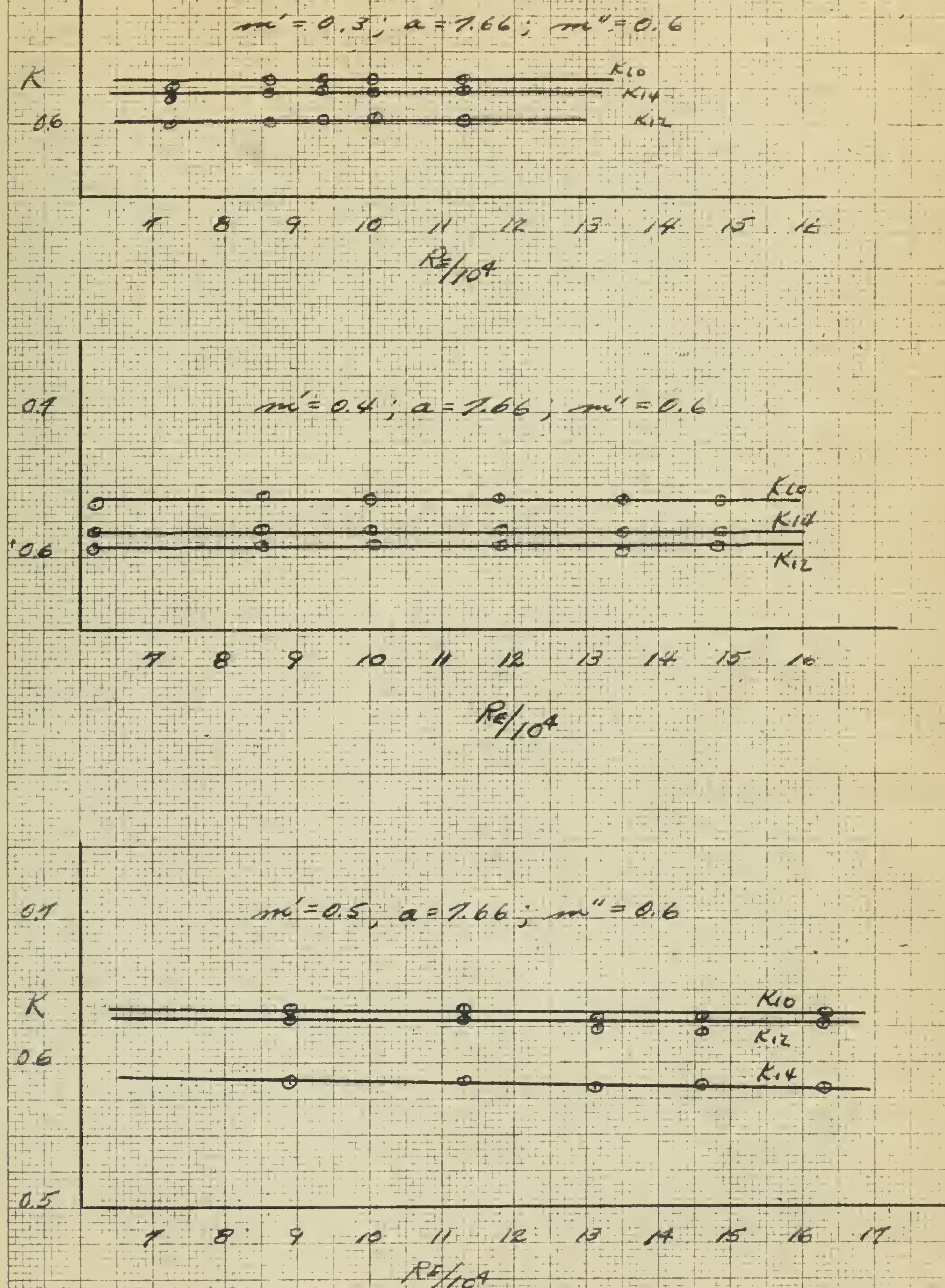
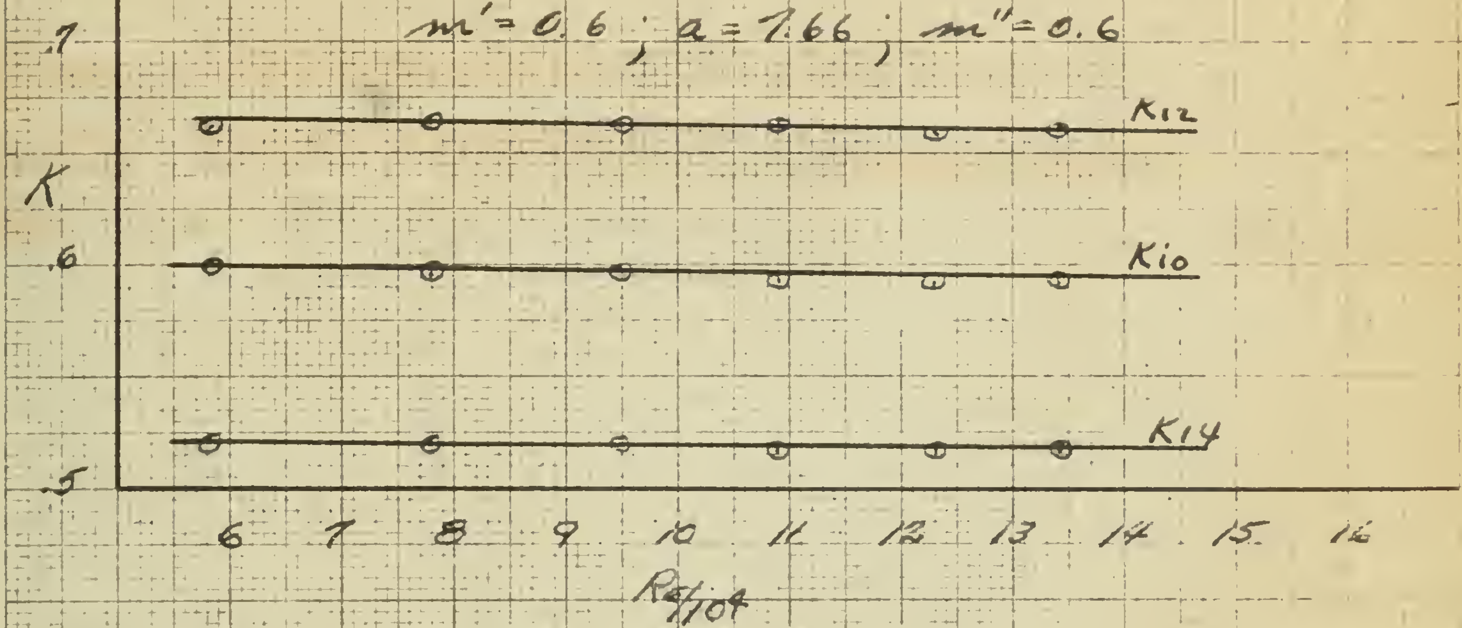


FIGURE XXXI

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER RE



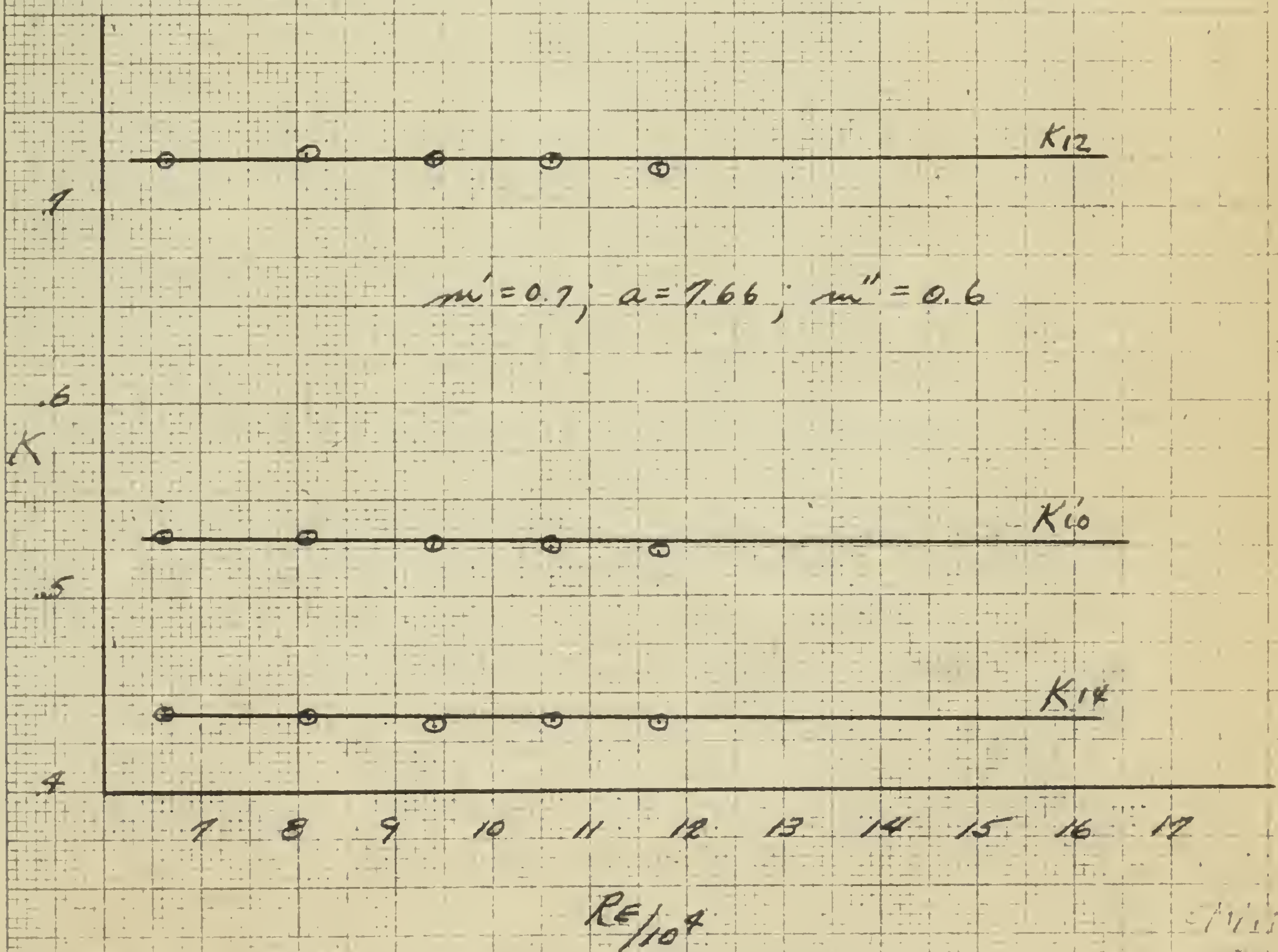


FIGURE XXXII

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER RE

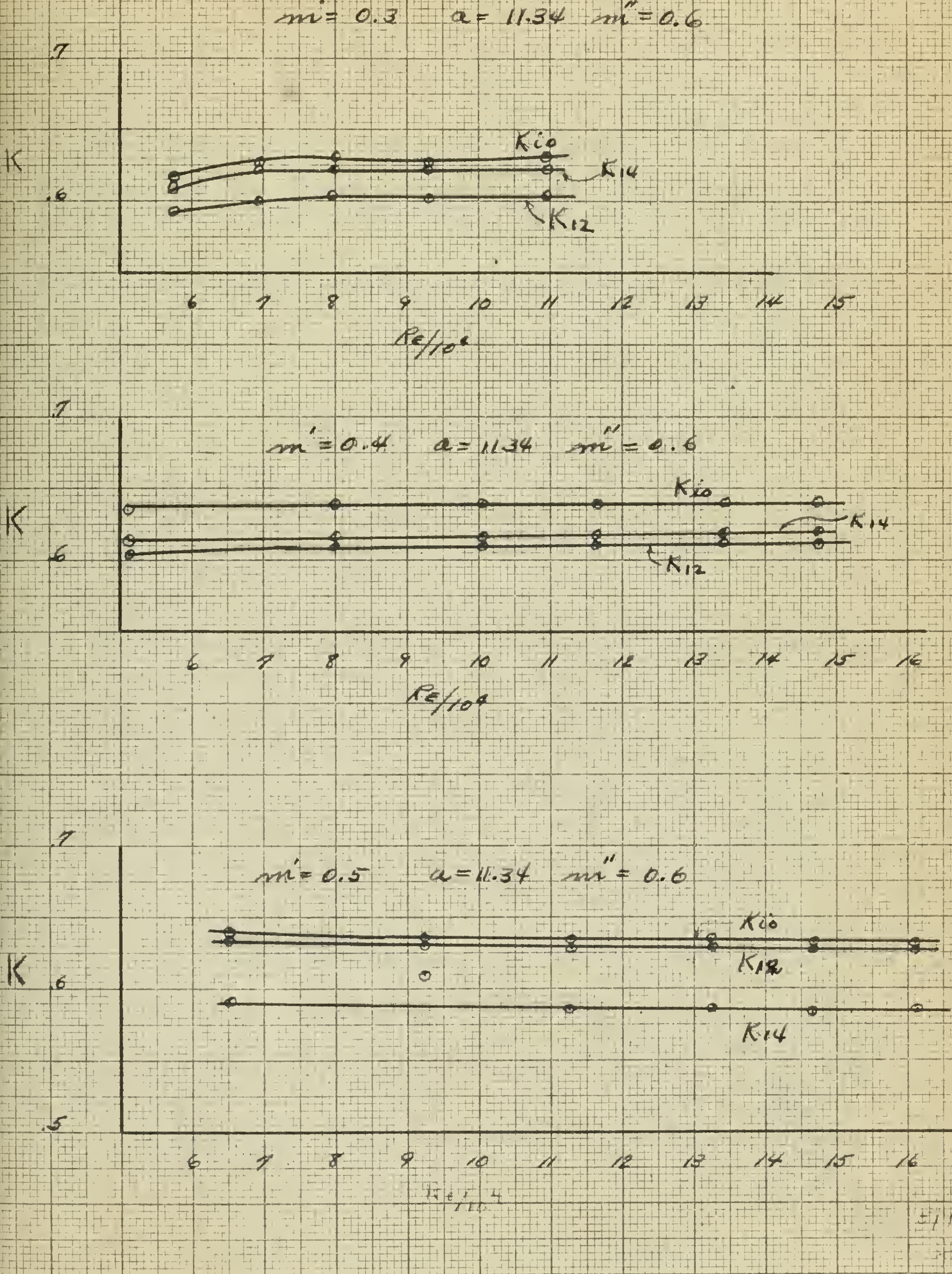


FIGURE XXXIII

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER Re

$m' = 0.6 \quad a = 11.34 \quad m'' = 0.6$

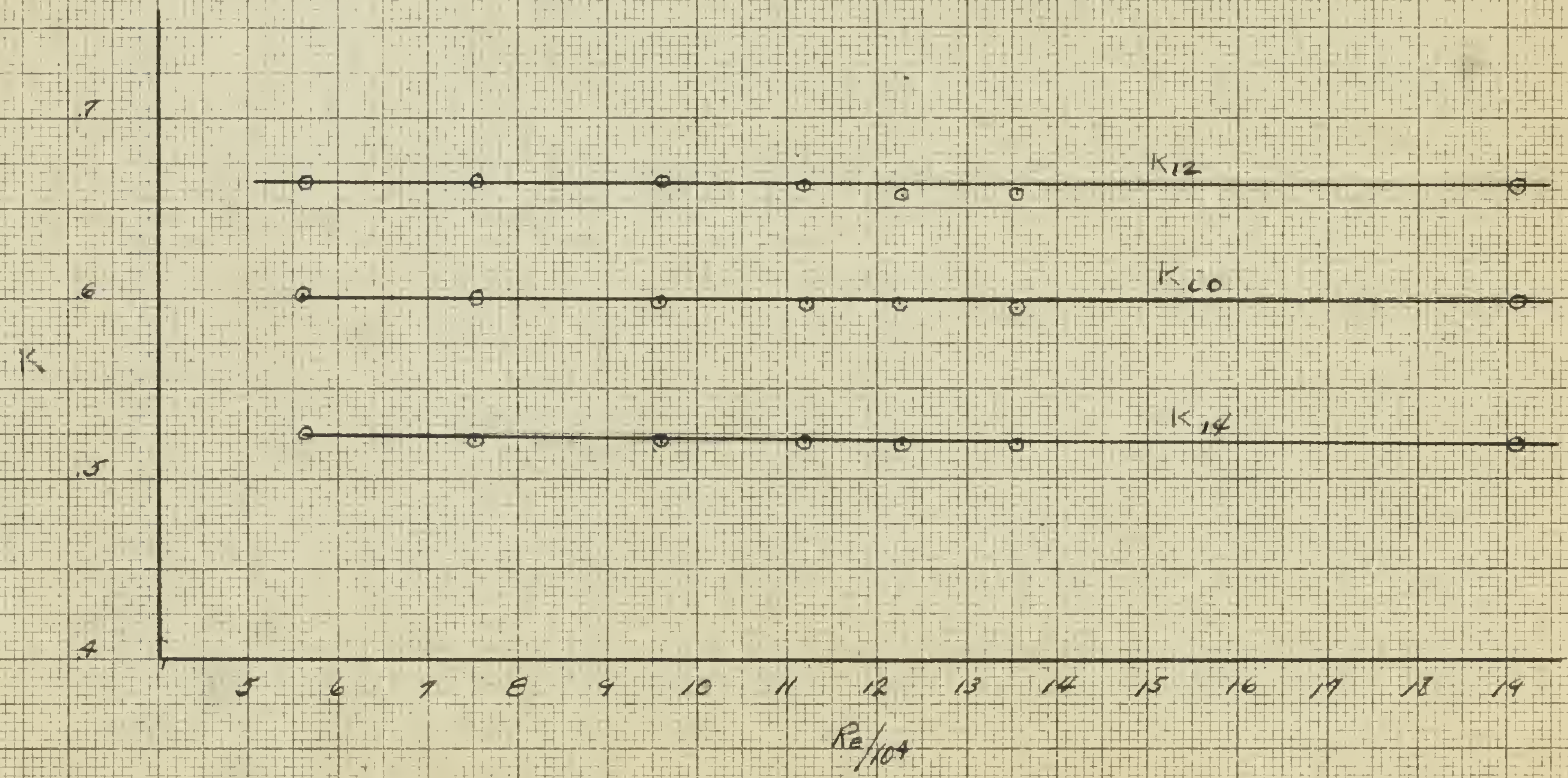


FIGURE XXXIV

DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER RE

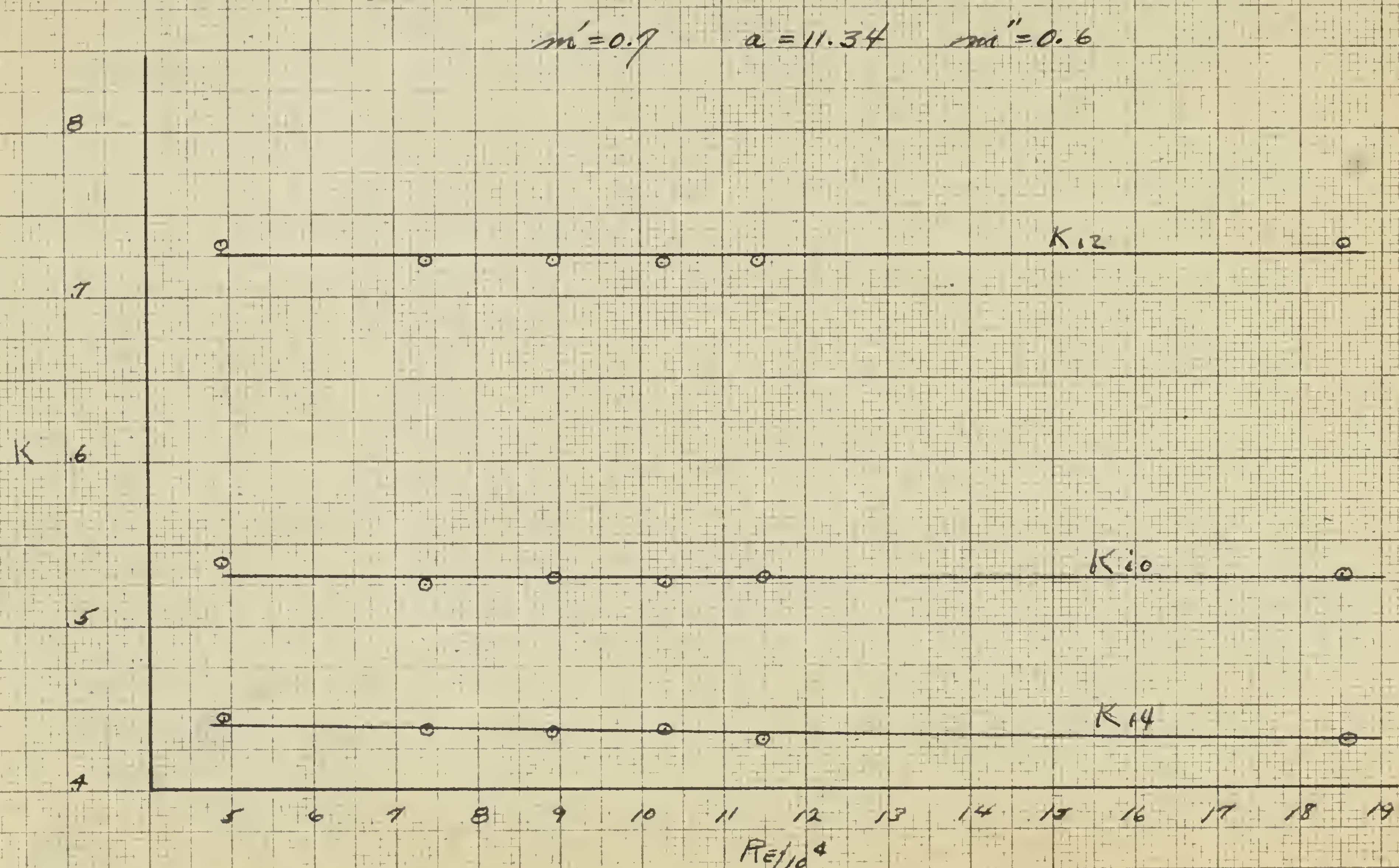


FIGURE XXXV

DISCHARGE COEFFICIENT K VS REYNOLDS NUMBER Re

SINGLE ORIFICE

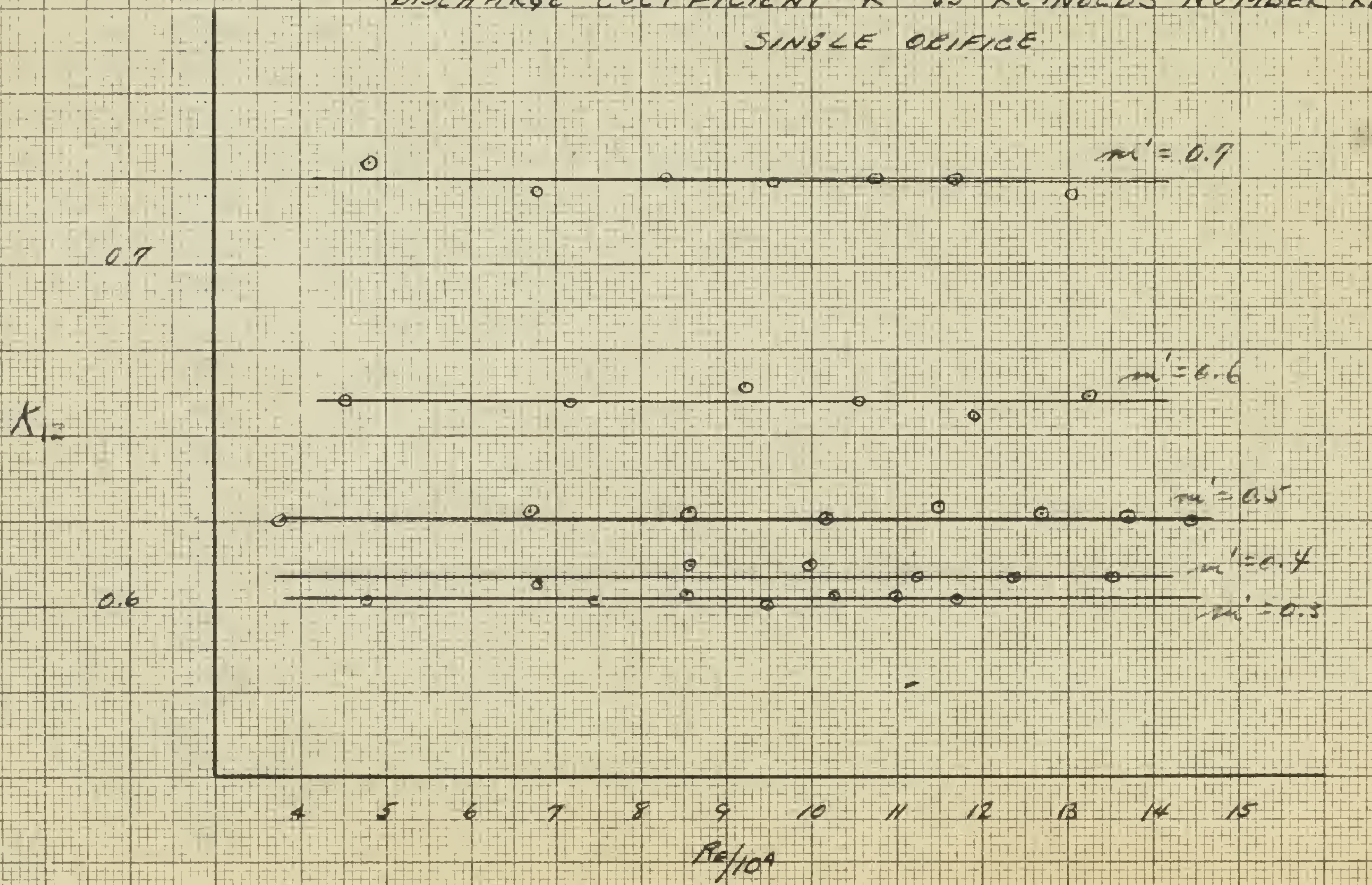
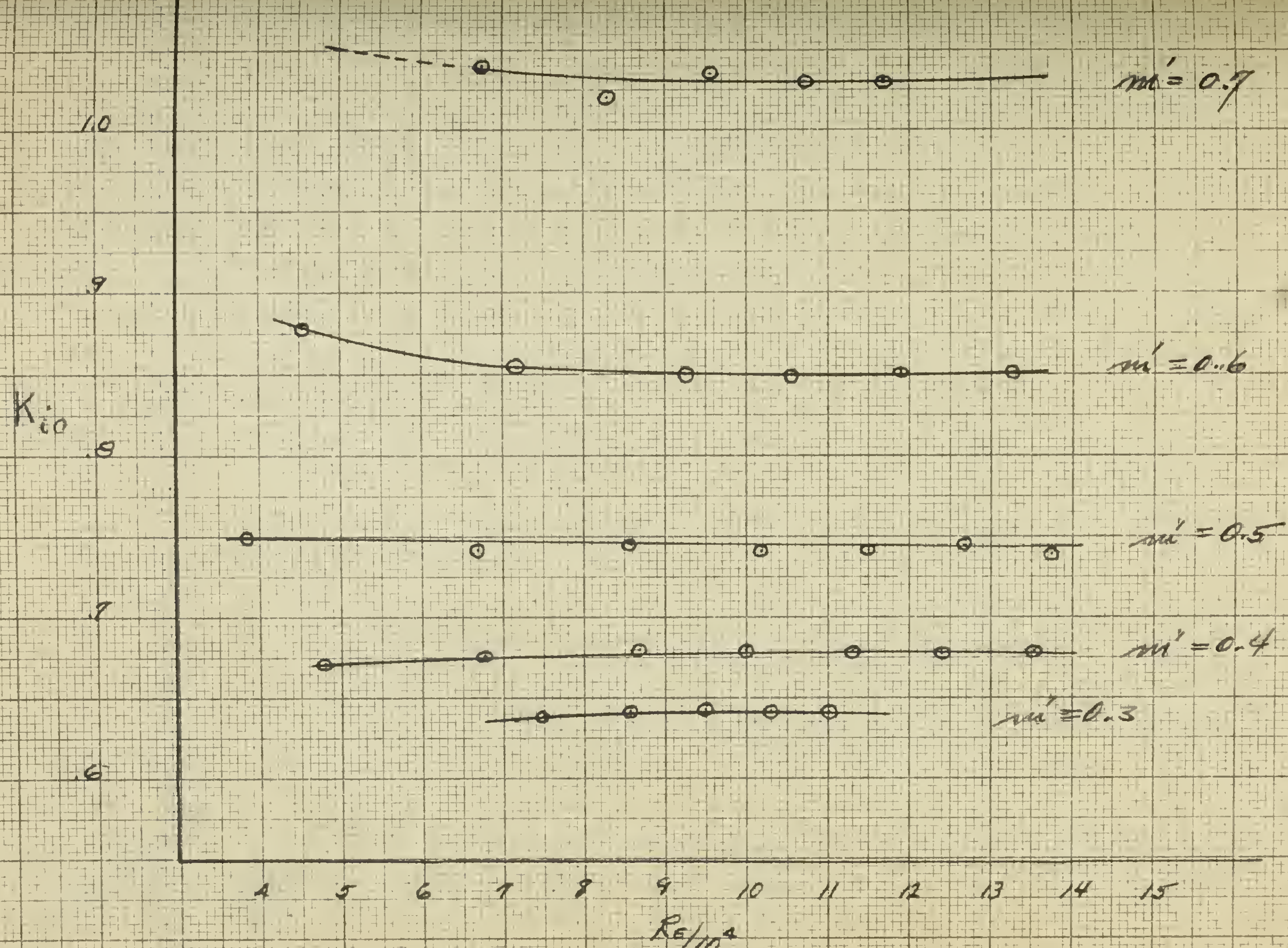


FIGURE XXXVI



DISCHARGE COEFFICIENT K VS. REYNOLDS NUMBER R_E
(SINGLE ORIFICE)

VARIATION OF DISCHARGE

COEFFICIENT, K, WITH

UPSTREAM ORIFICE RATIO, m'

FIGURE XXXVII

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

$a = 0.965$; $m'' = 0.5$; $Re = 10^5$

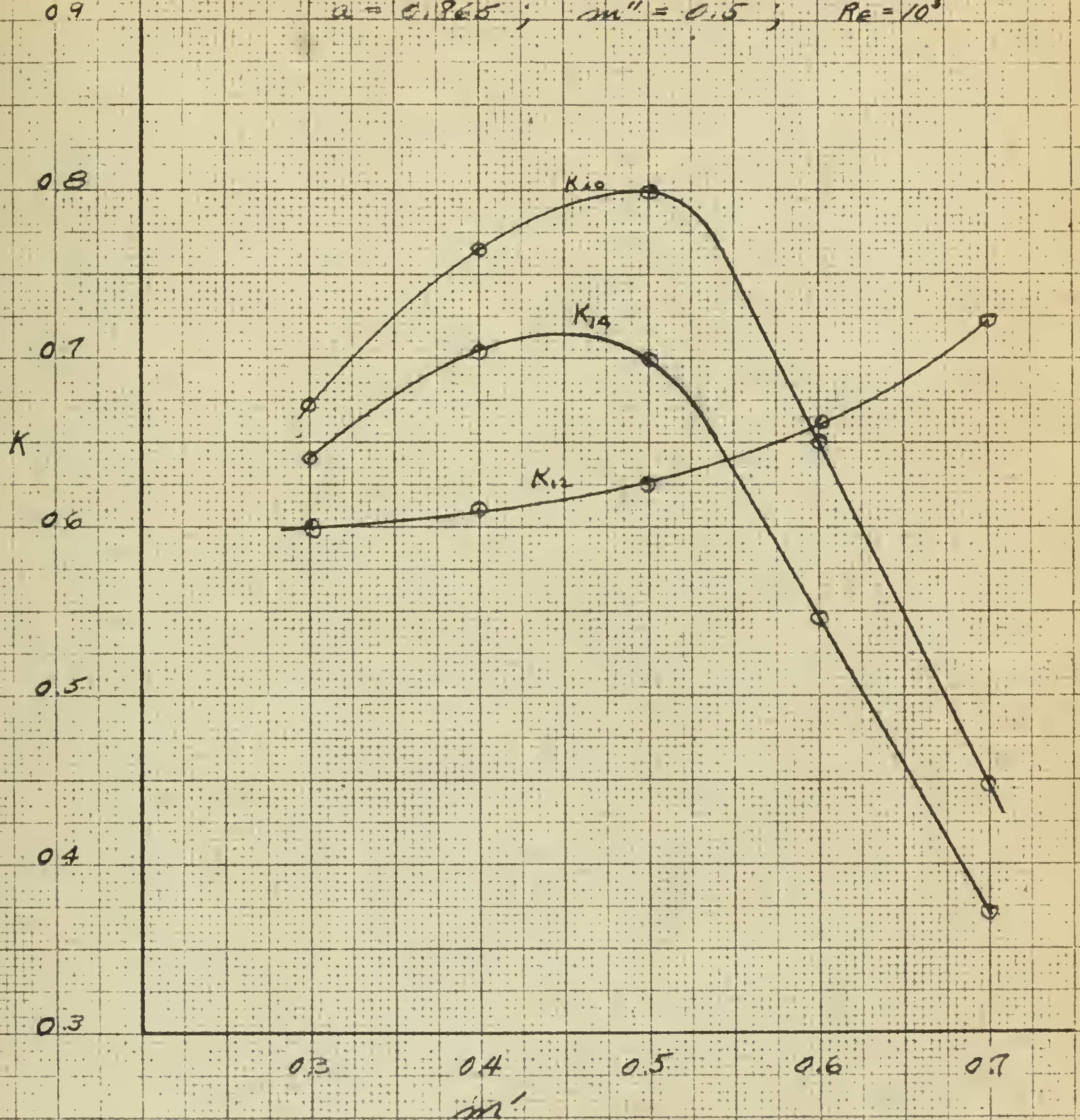


FIGURE XXXVIII

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

a = 0.865 ; m" = 0.6 ; Re = 10^5

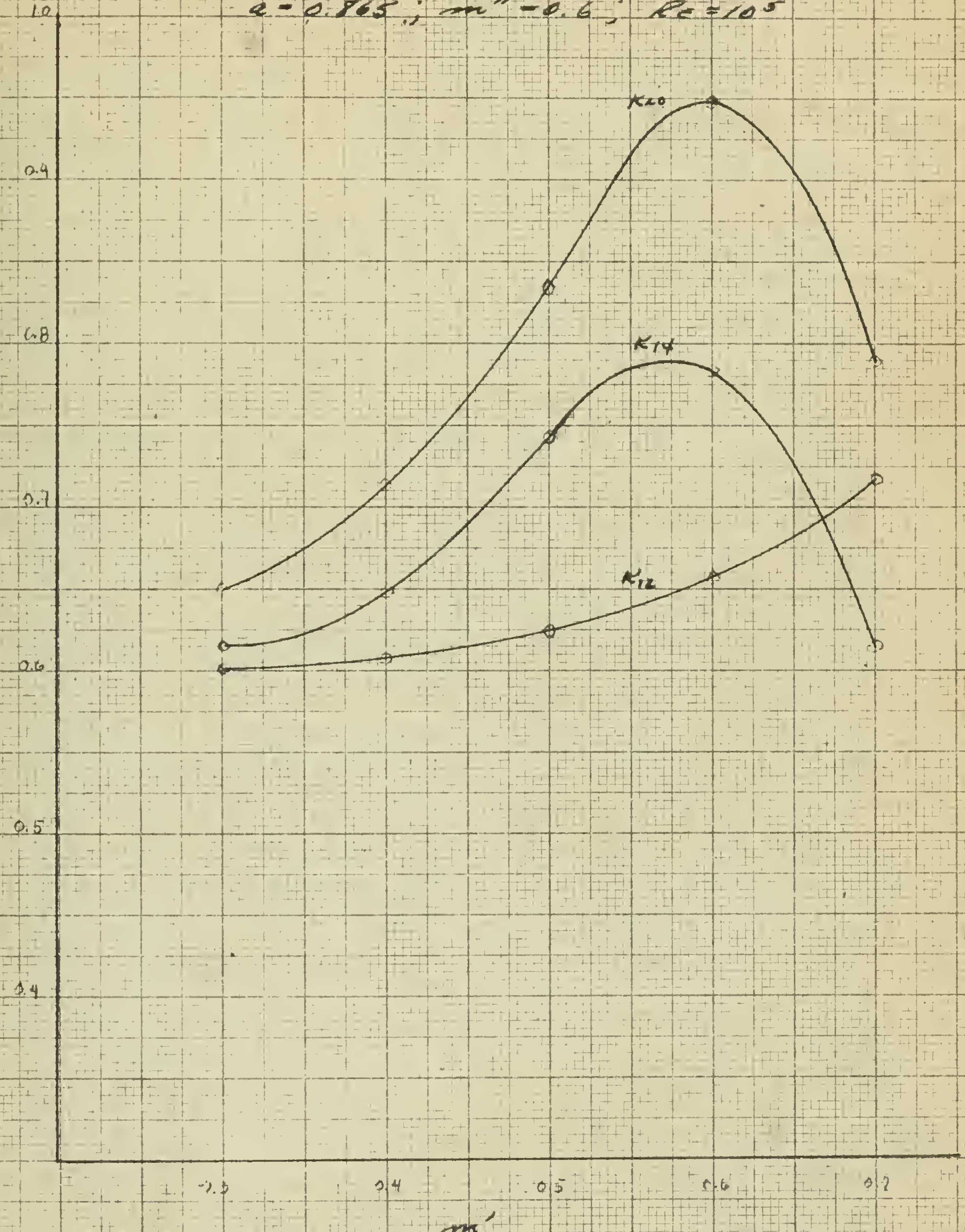


FIGURE XXXIX

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

$a = 1.423$; $m'' = 0.5$; $Re = 10^5$

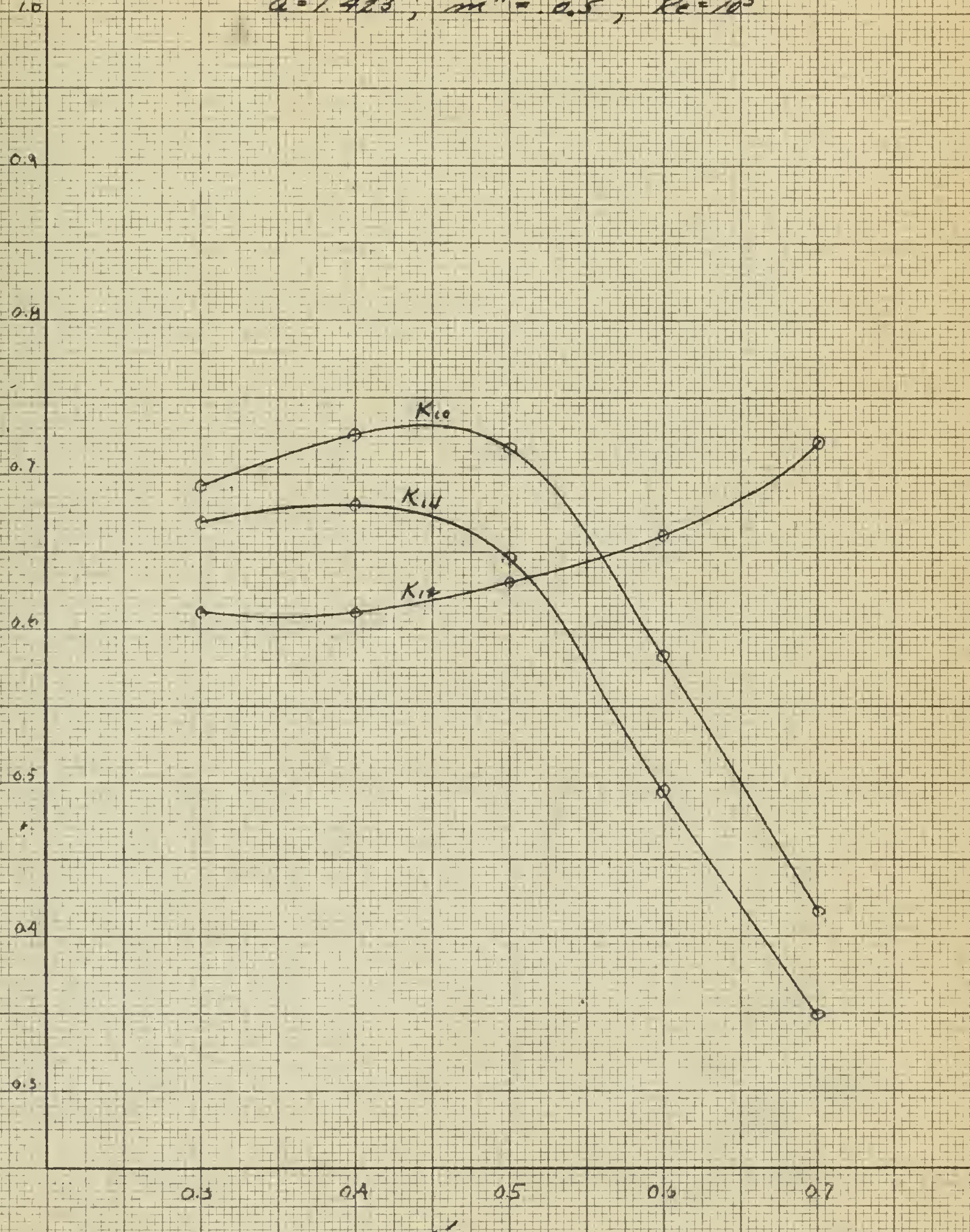


FIGURE XL

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

[illegible] = 1.425   m'' = [illegible]   [illegible] = 10

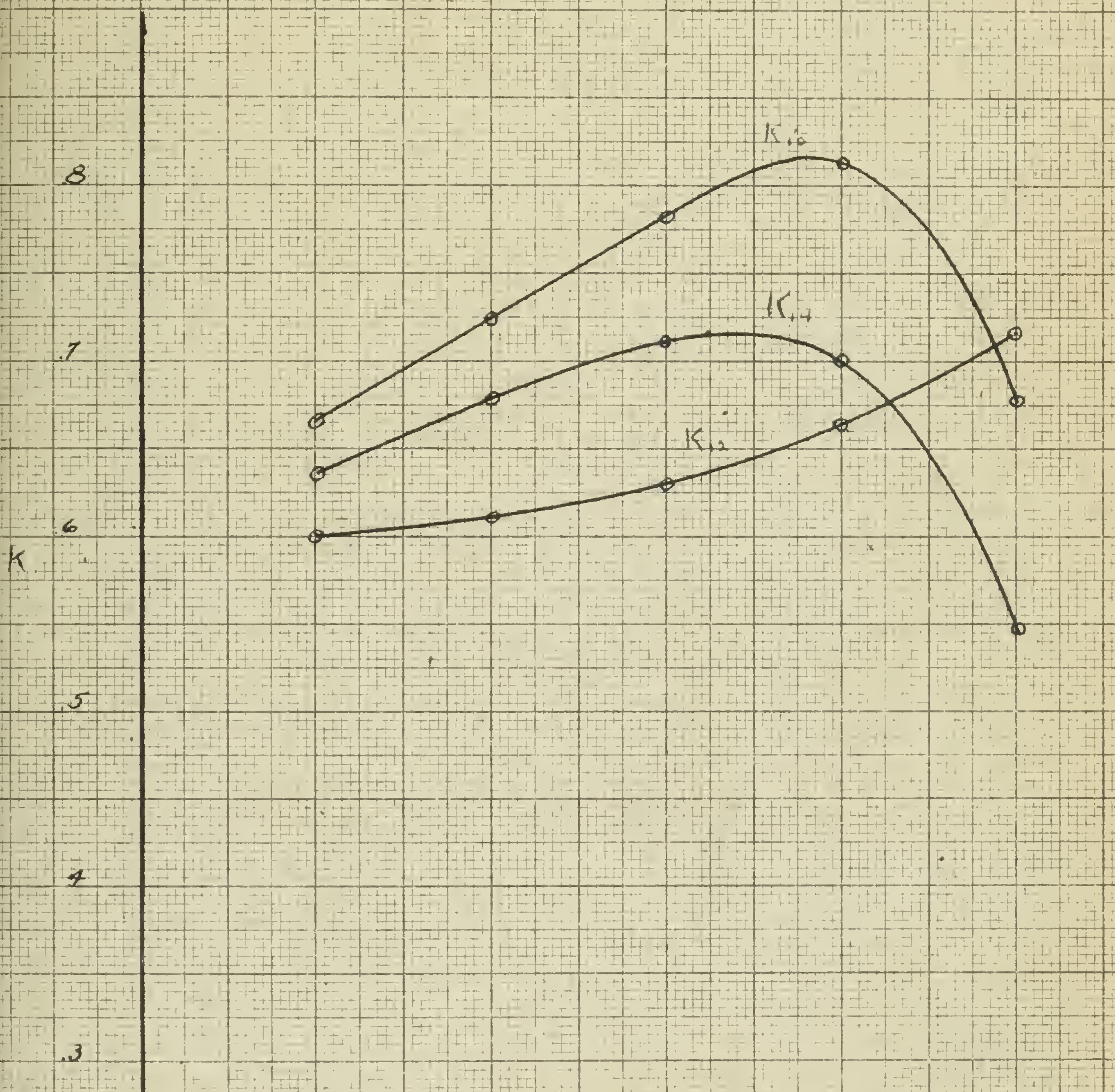


FIGURE XLI

VARIATION OF DISCHARGE COEFFICIENT K
WITH UPSTREAM ORIFICE RATIO m'

$\alpha = 2.1$ $m'' = 0.5$ $R_E = 10^5$

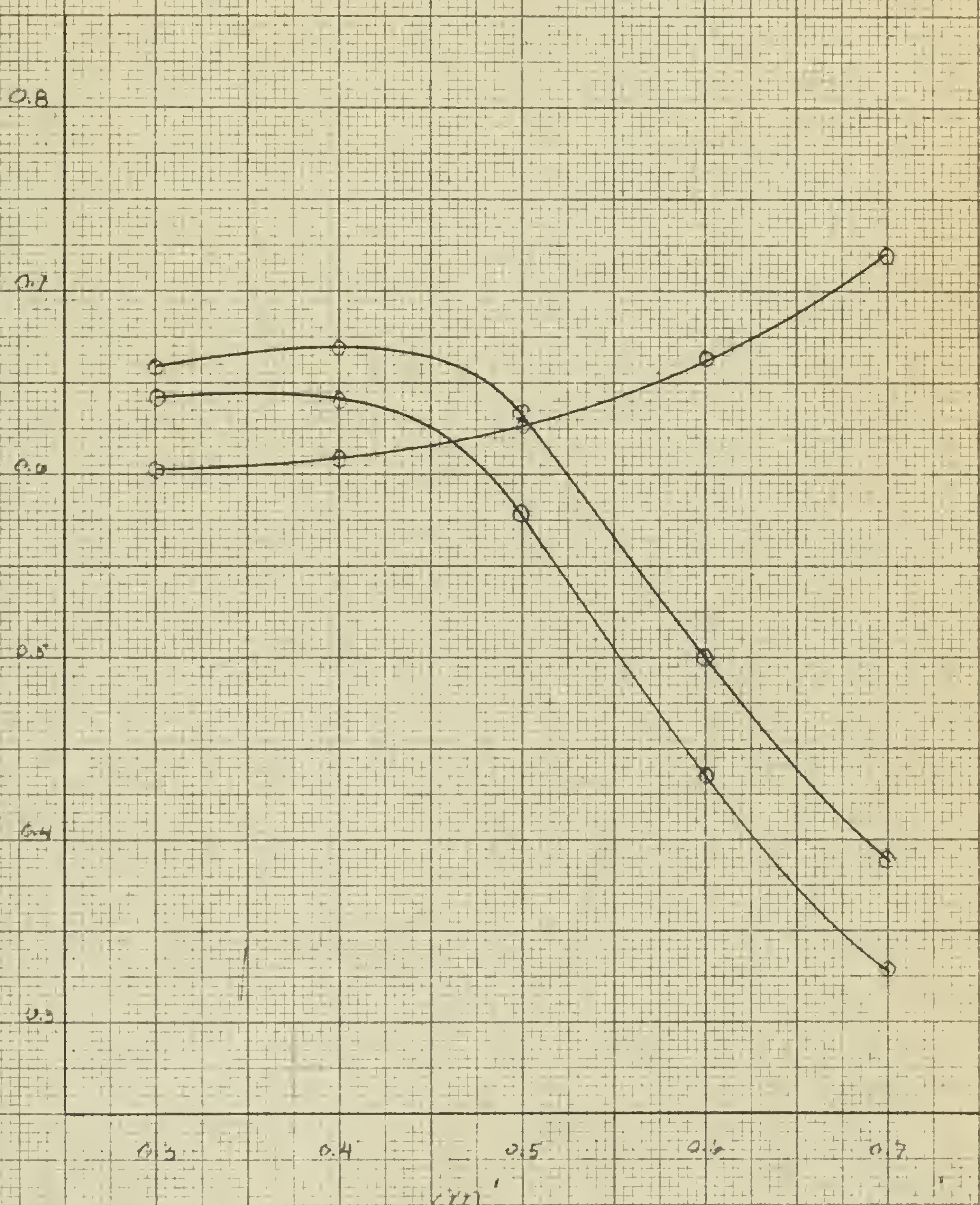


FIGURE XLII

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

$a = 2.10 \quad m'' = 0.6 \quad R_E = 10^5$

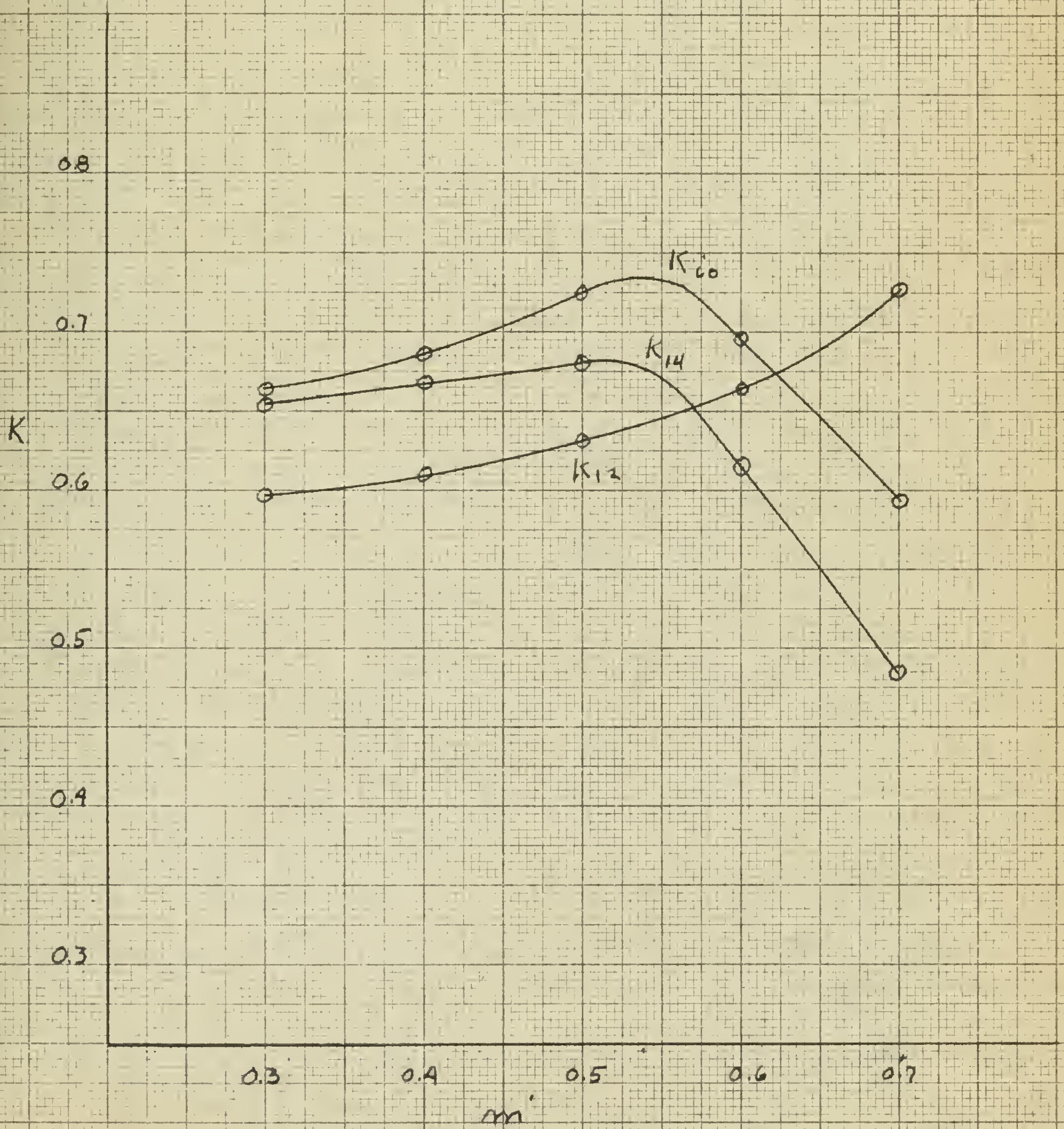


FIGURE XLIII

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

$a = 3.98$; $m'' = 0.5$; $Re = 10^5$

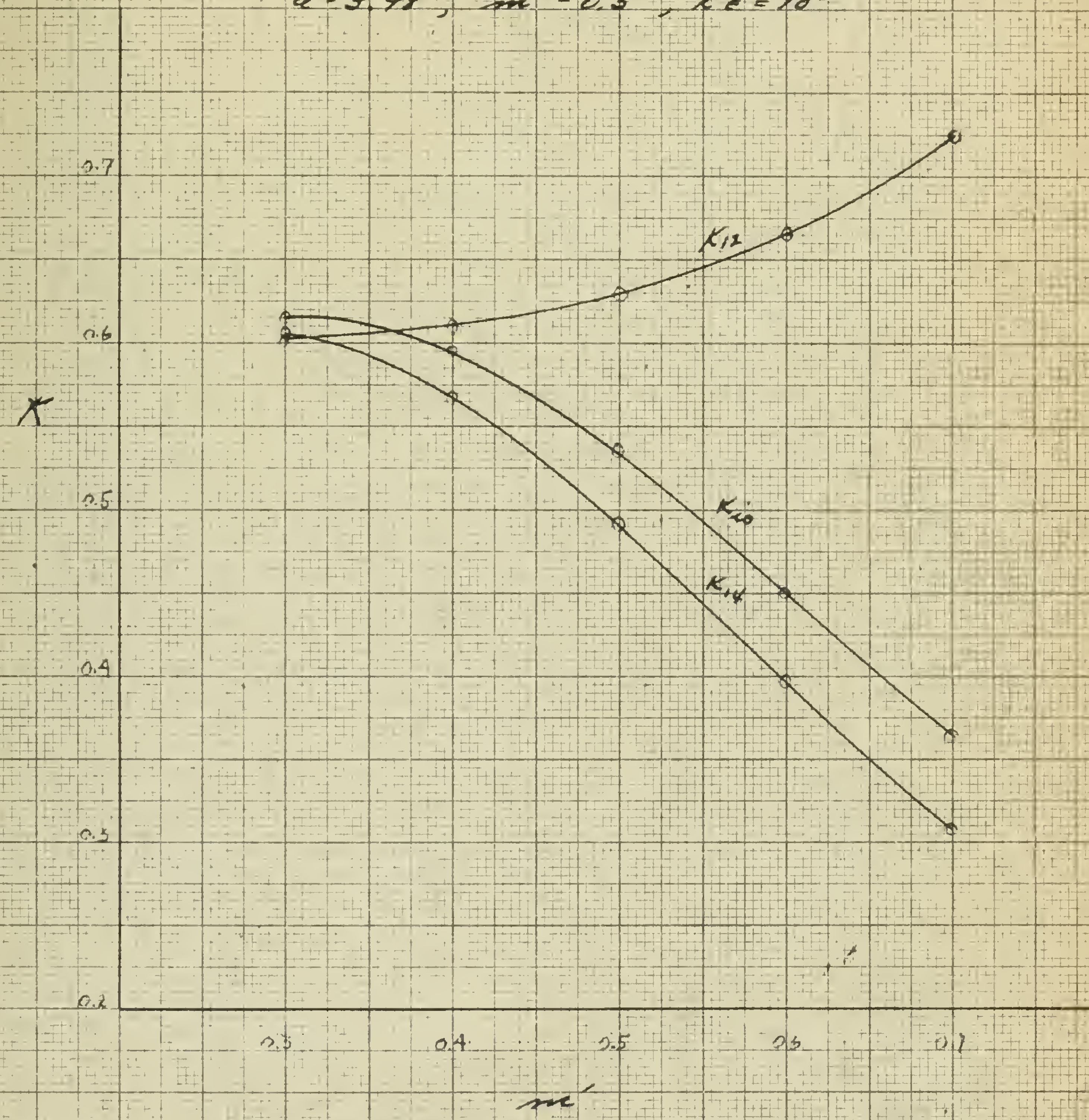


FIGURE XLIV

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

$a = 3.98 \quad m'' = 0.6 \quad R_E = 10^5$

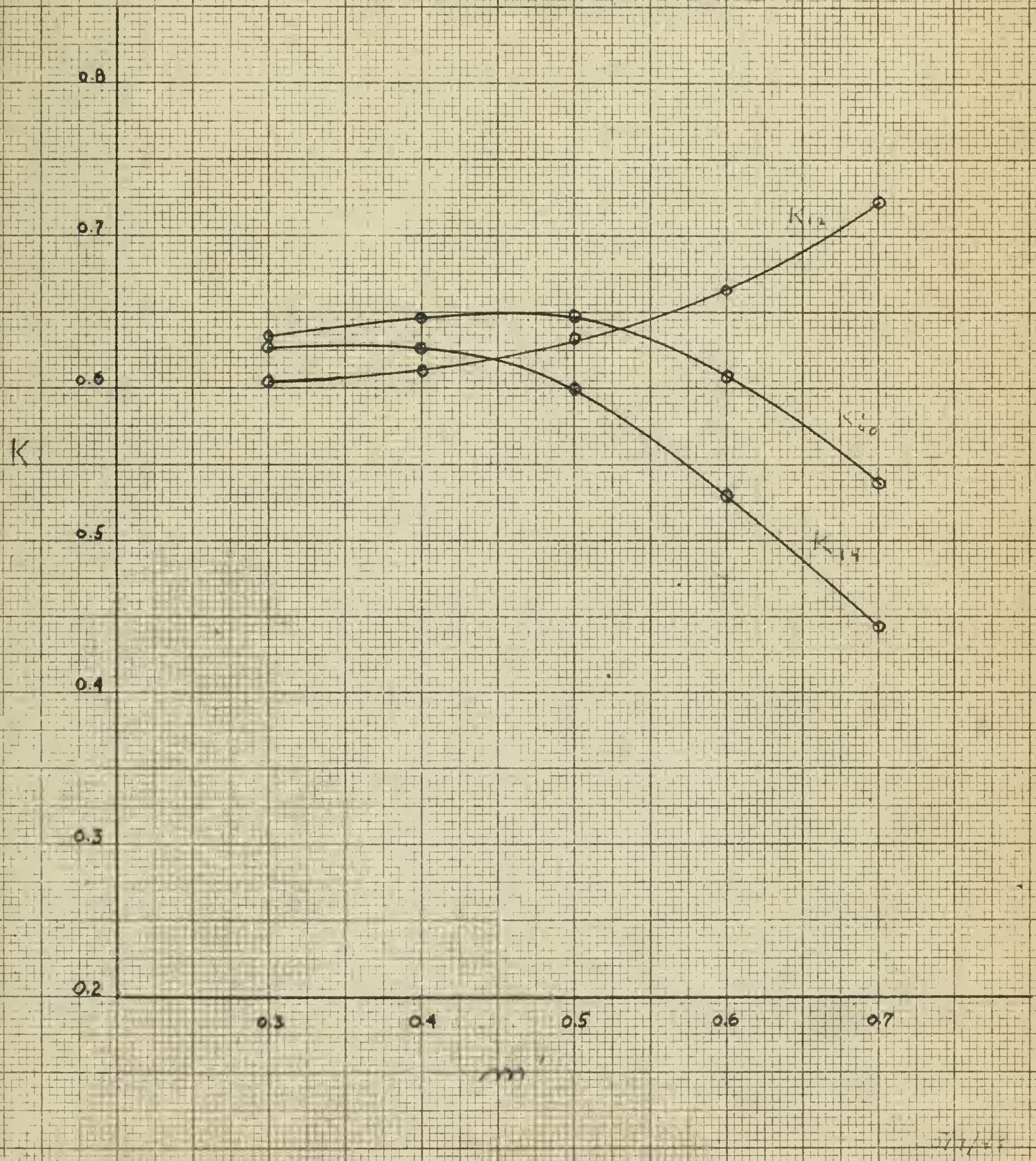


FIGURE XLV

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

$a = 7.66$; $m'' = 0.5$; $R_E = 10^5$

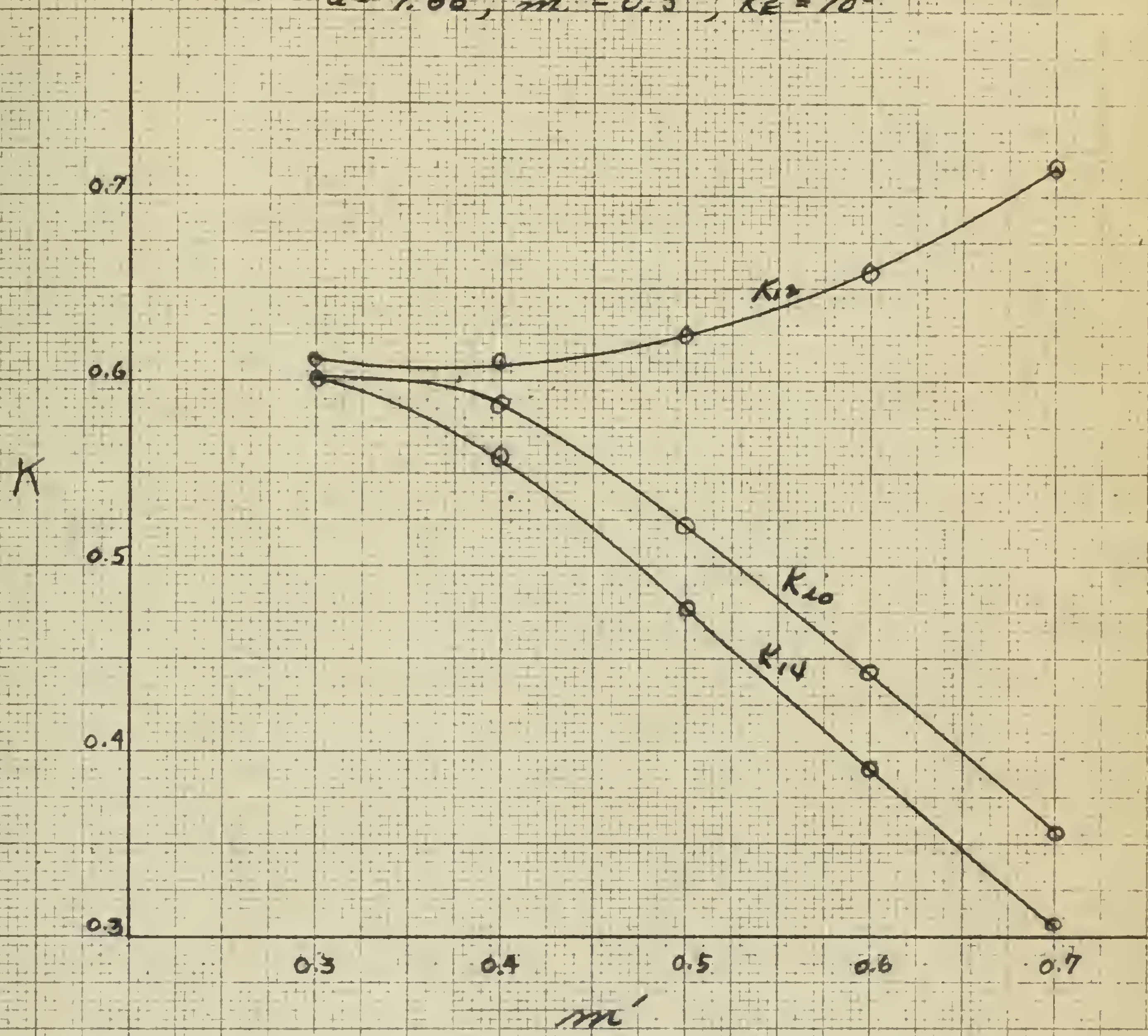


FIGURE XLVI

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m′

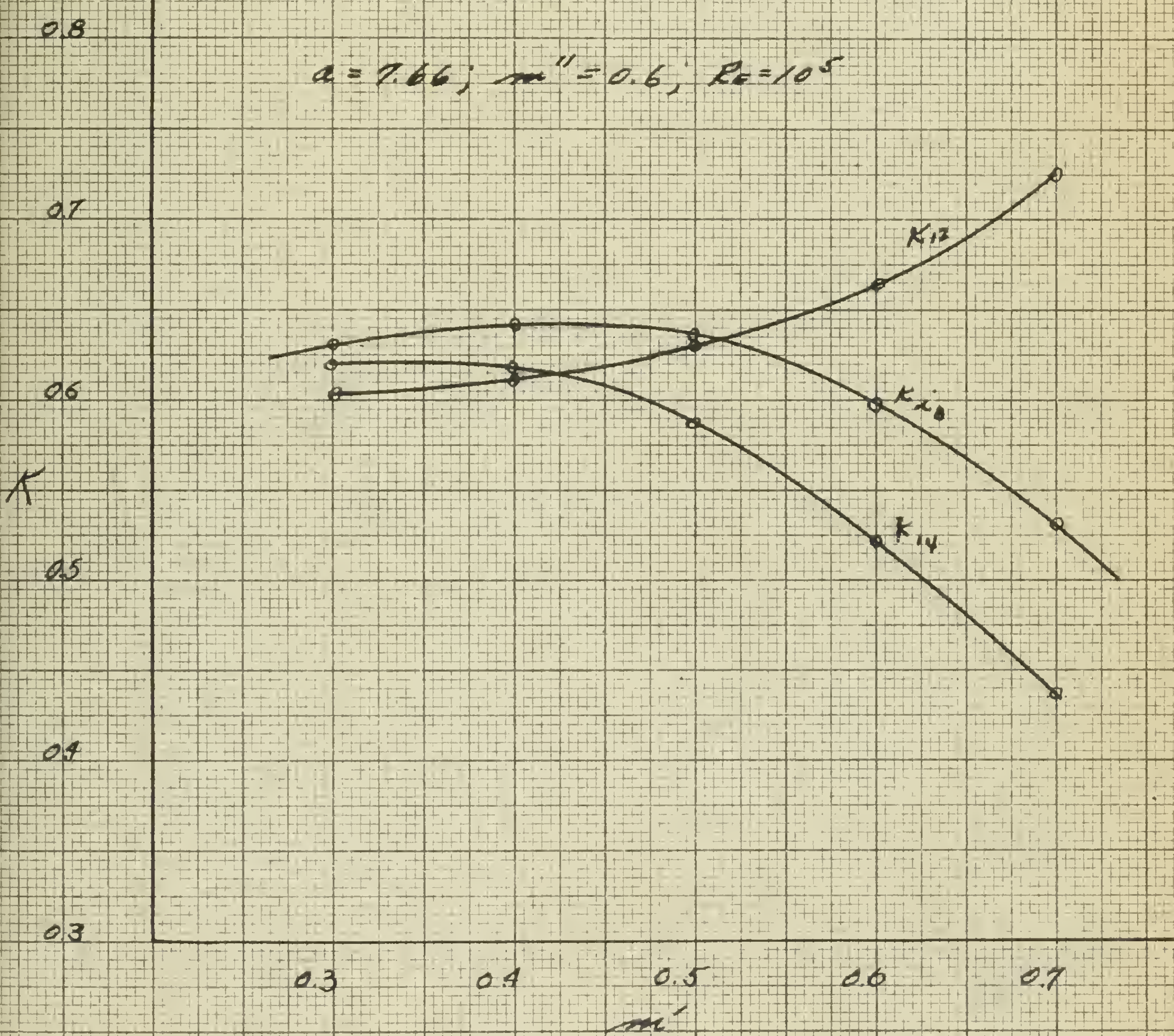


FIGURE XLVII

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'

$a = 11.34$; $m'' = 0.5$; $Re = 10^5$

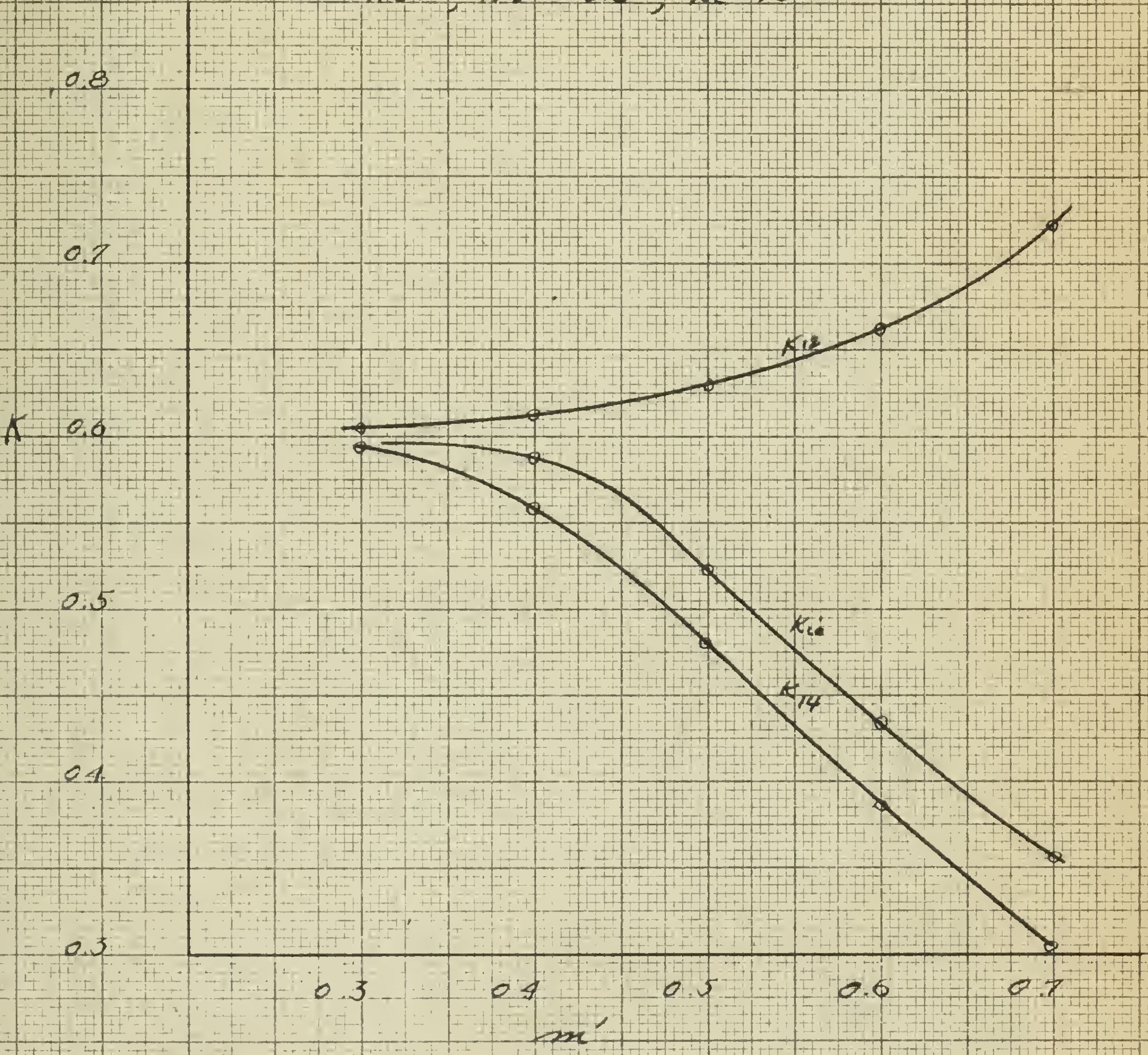
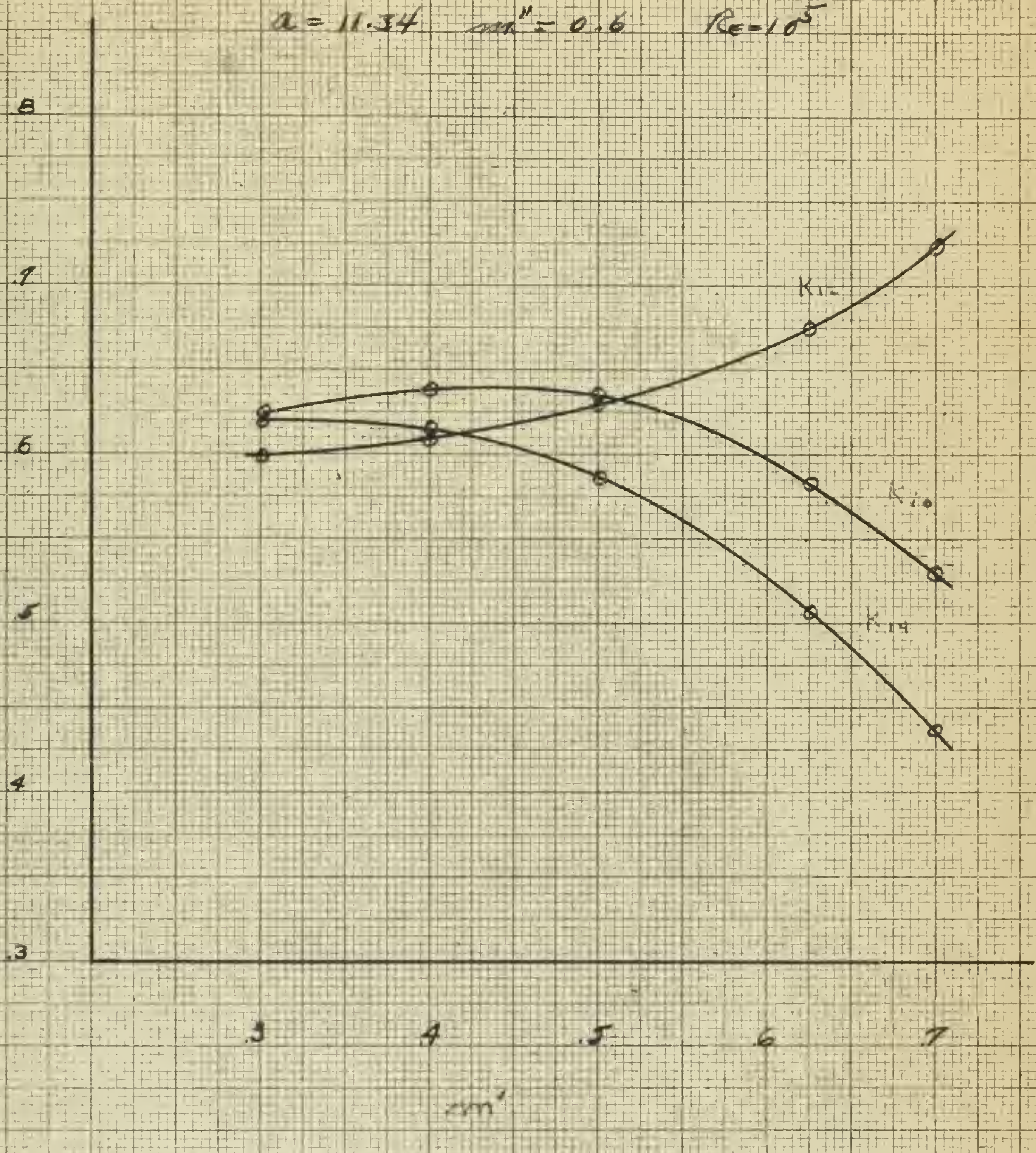


FIGURE XLVIII

VARIATION OF DISCHARGE COEFFICIENT K WITH UPSTREAM ORIFICE RATIO m'



5/9/49
H.S.D.

FIGURE XLIX

VARIATION OF DISCHARGE COEFFICIENT K WITH ORIFICE RATIO

(SINGLE ORIFICE)

$Re = 10^5$

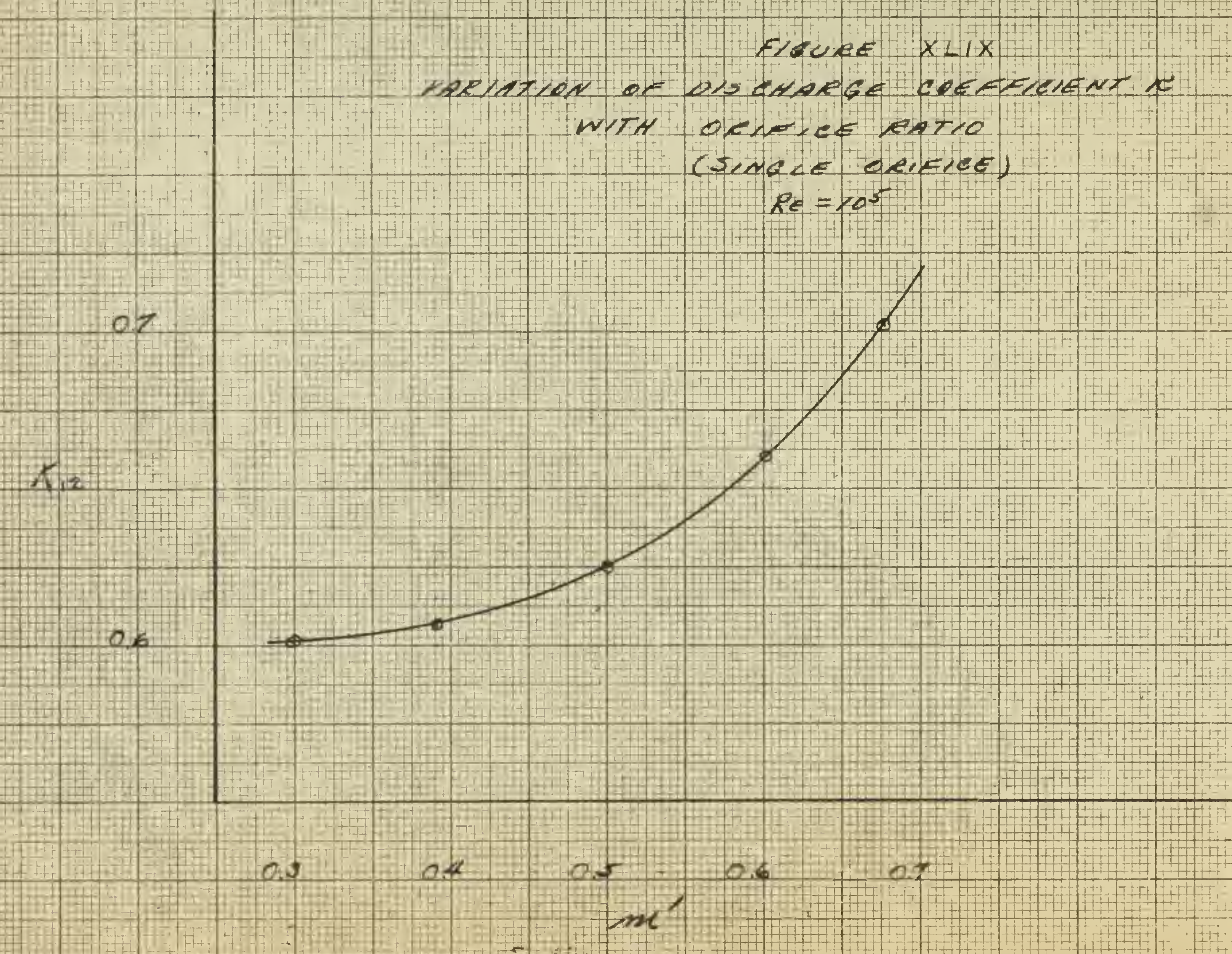
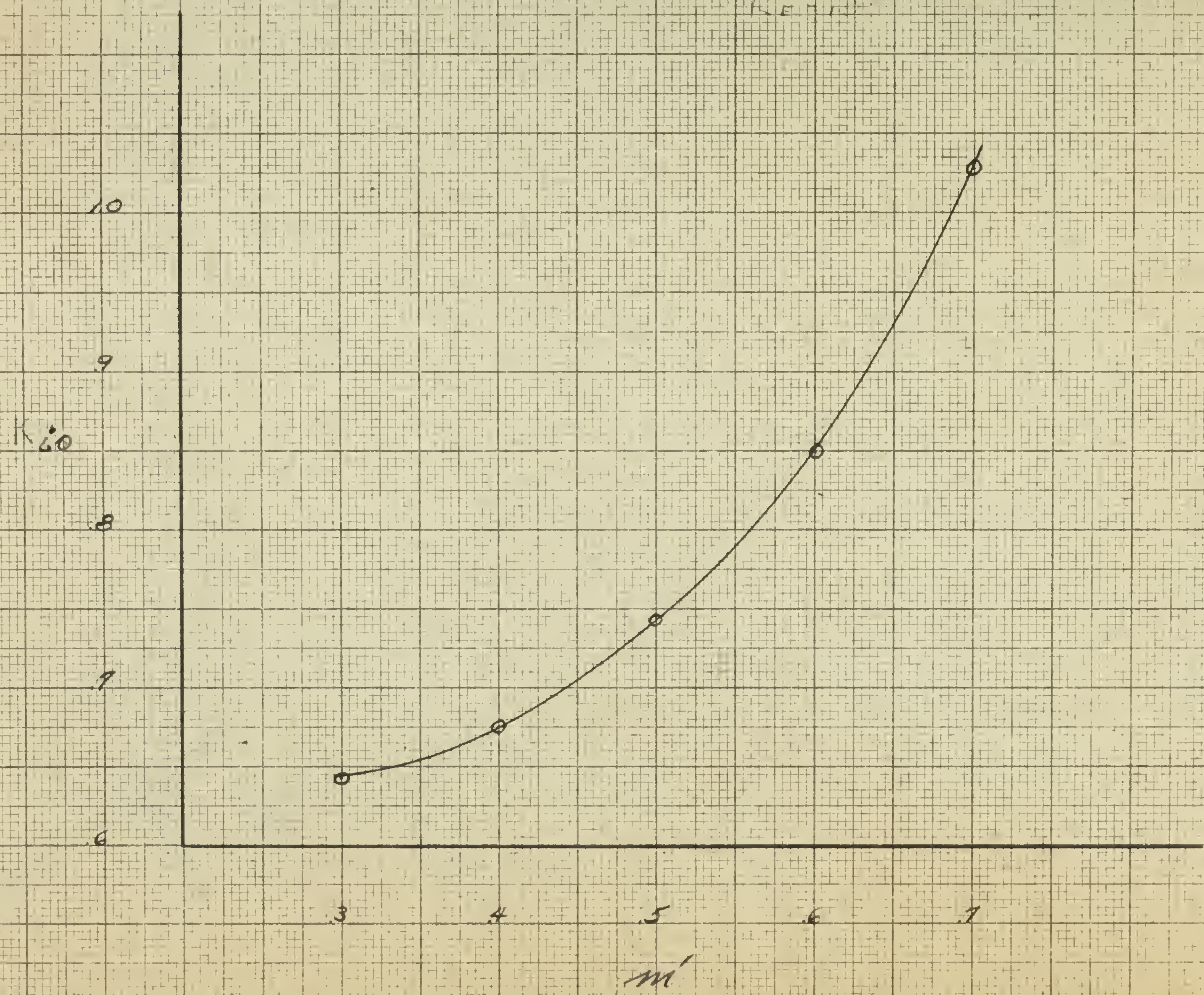


FIGURE L

VARIATION OF DISCHARGE COEFFICIENT WITH ORIFICE RATIO m'. (SINGLE ORIFICE



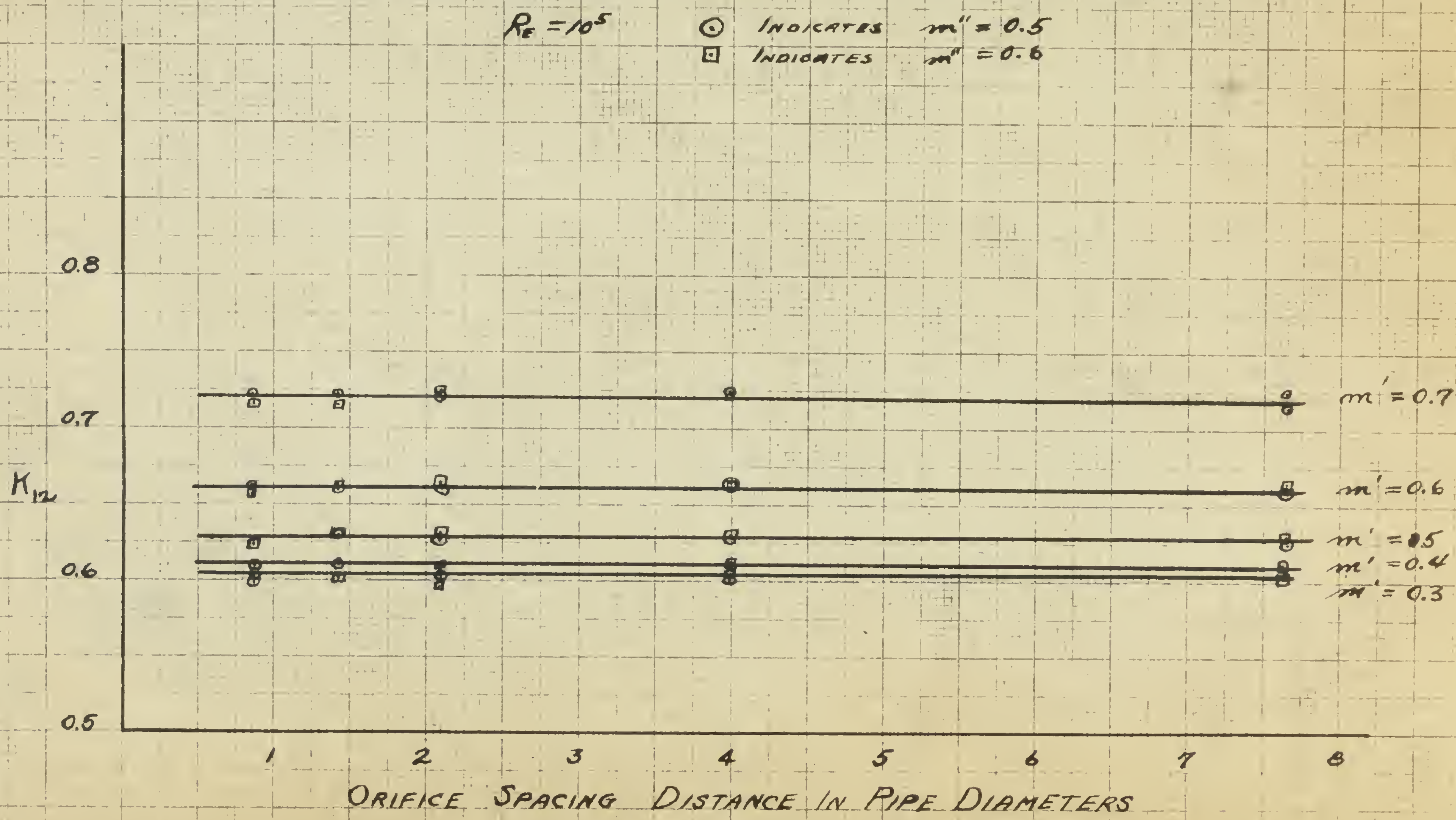
5/9/49

DISCHARGE COEFFICIENT, K, VERSUS

ORIFICE SPACING DISTANCE

FIGURE L1

DISCHARGE COEFFICIENT K_{12} VS SPACING DISTANCE



5/9/49

FIGURE LII

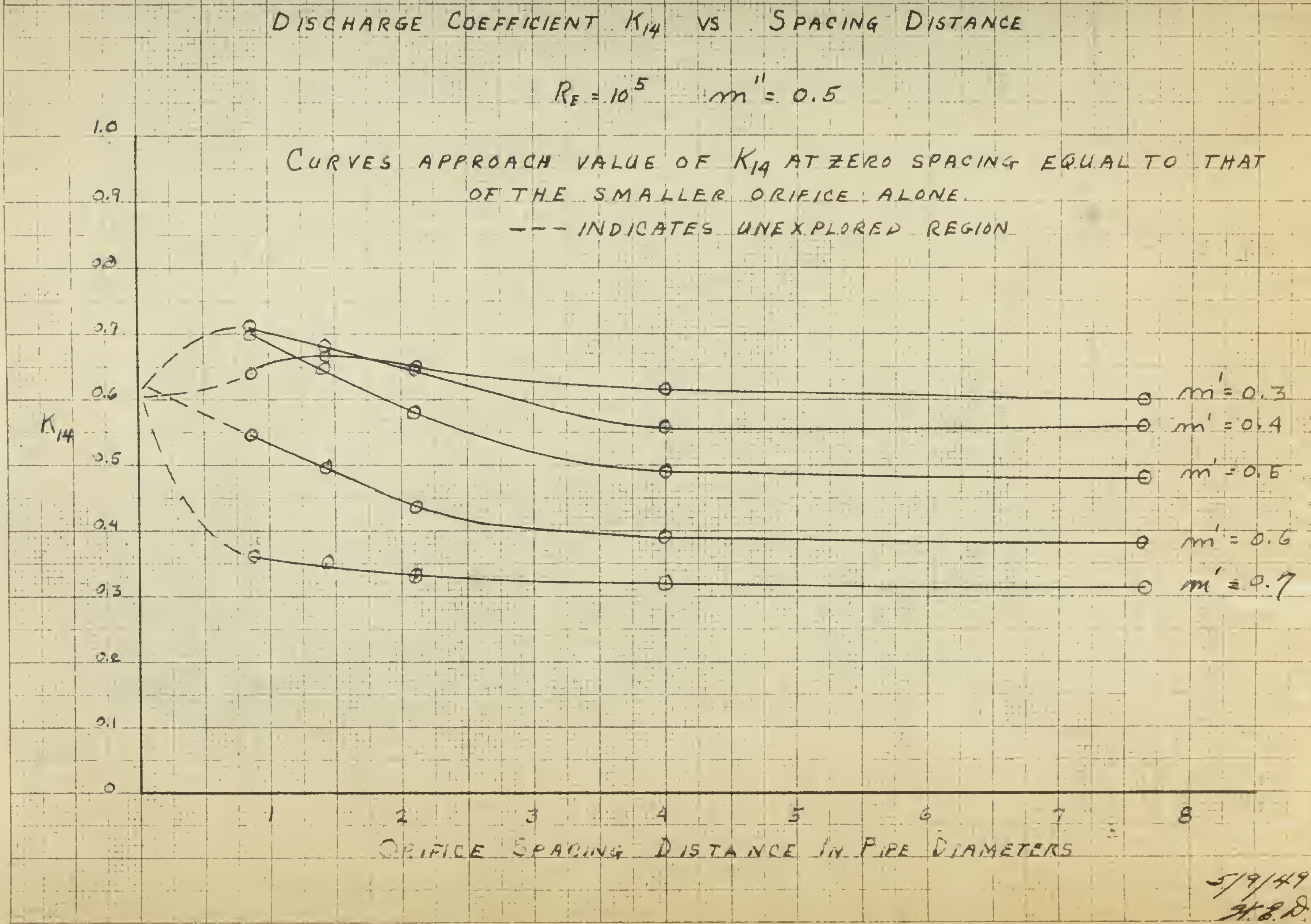
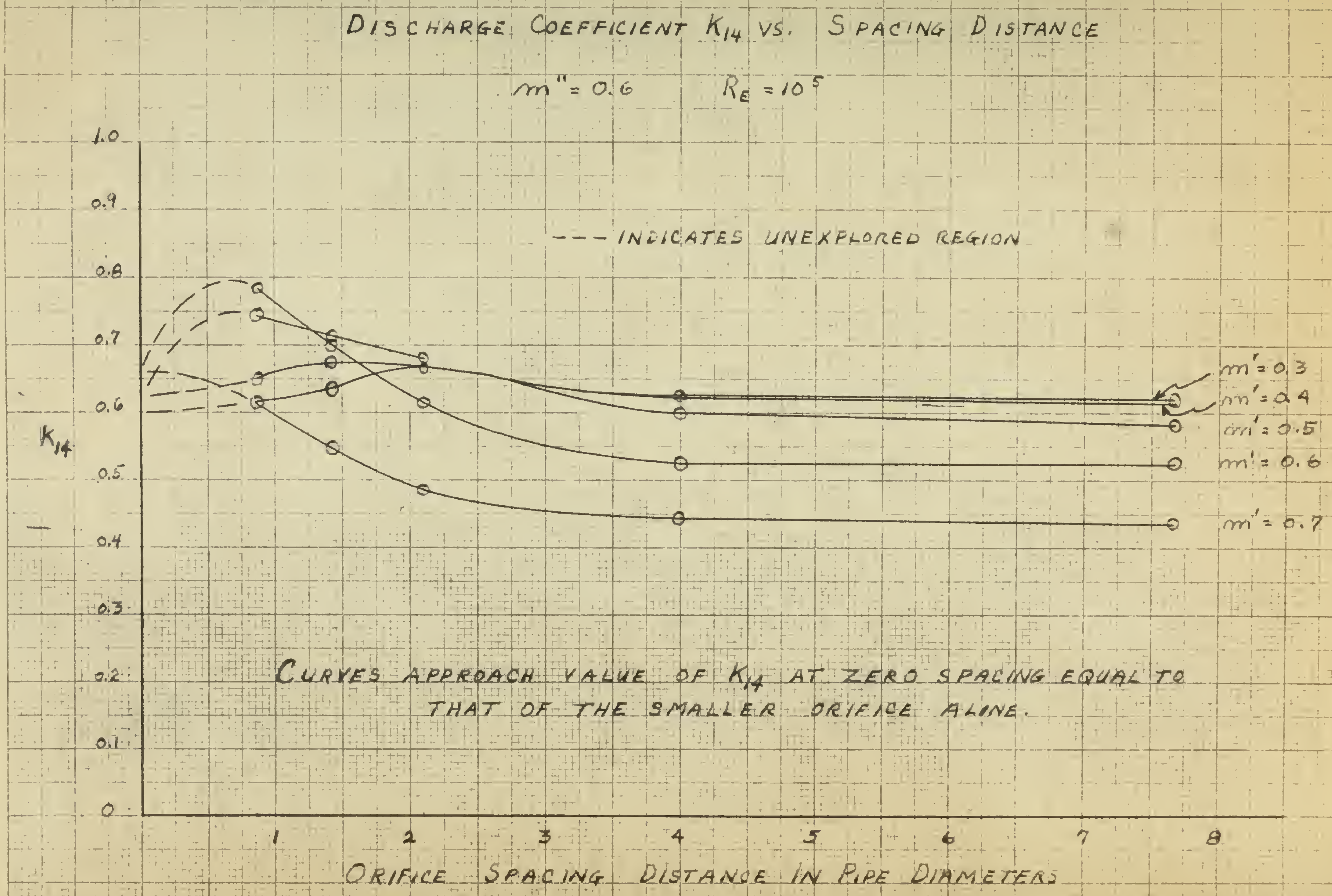

DISCHARGE COEFFICIENT K_{14} VS SPACING DISTANCE
$R_E = 10^5$ $m'' = 0.5$
CURVES APPROACH VALUE OF K_{14} AT ZERO SPACING EQUAL TO THAT OF THE SMALLER ORIFICE ALONE.
--- INDICATES UNEXPLORED REGION
K_{14}
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1
2
3
4
5
6
7
8
$m' = 0.3$
$m' = 0.4$
$m' = 0.5$
$m' = 0.6$
$m' = 0.7$
ORIFICE SPACING DISTANCE IN PIPE DIAMETERS
5/9/49

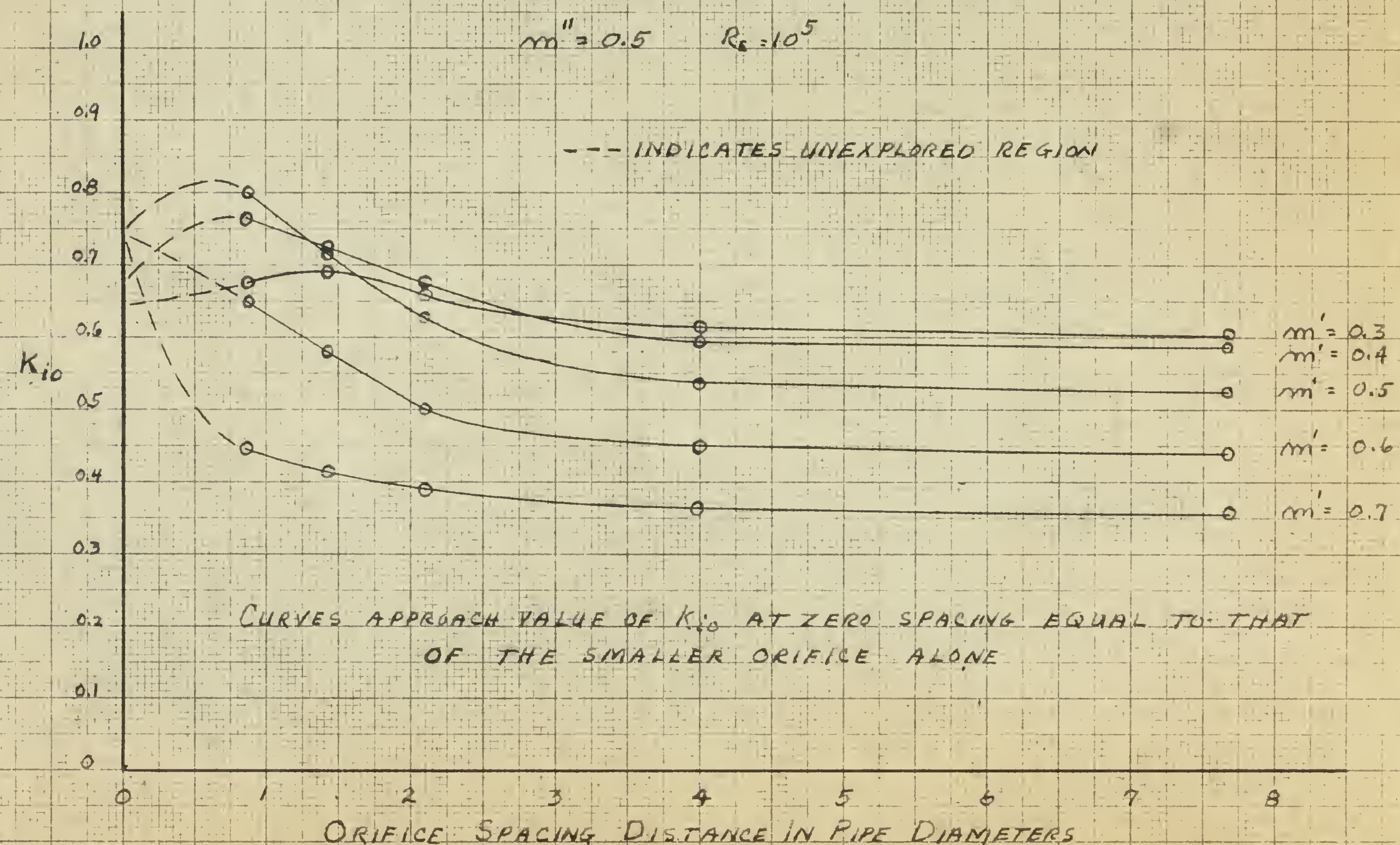
FIGURE LIII



5/9/49
H.E.D.

FIGURE LIV

DISCHARGE COEFFICIENT K_{io} VS. SPACING DISTANCE

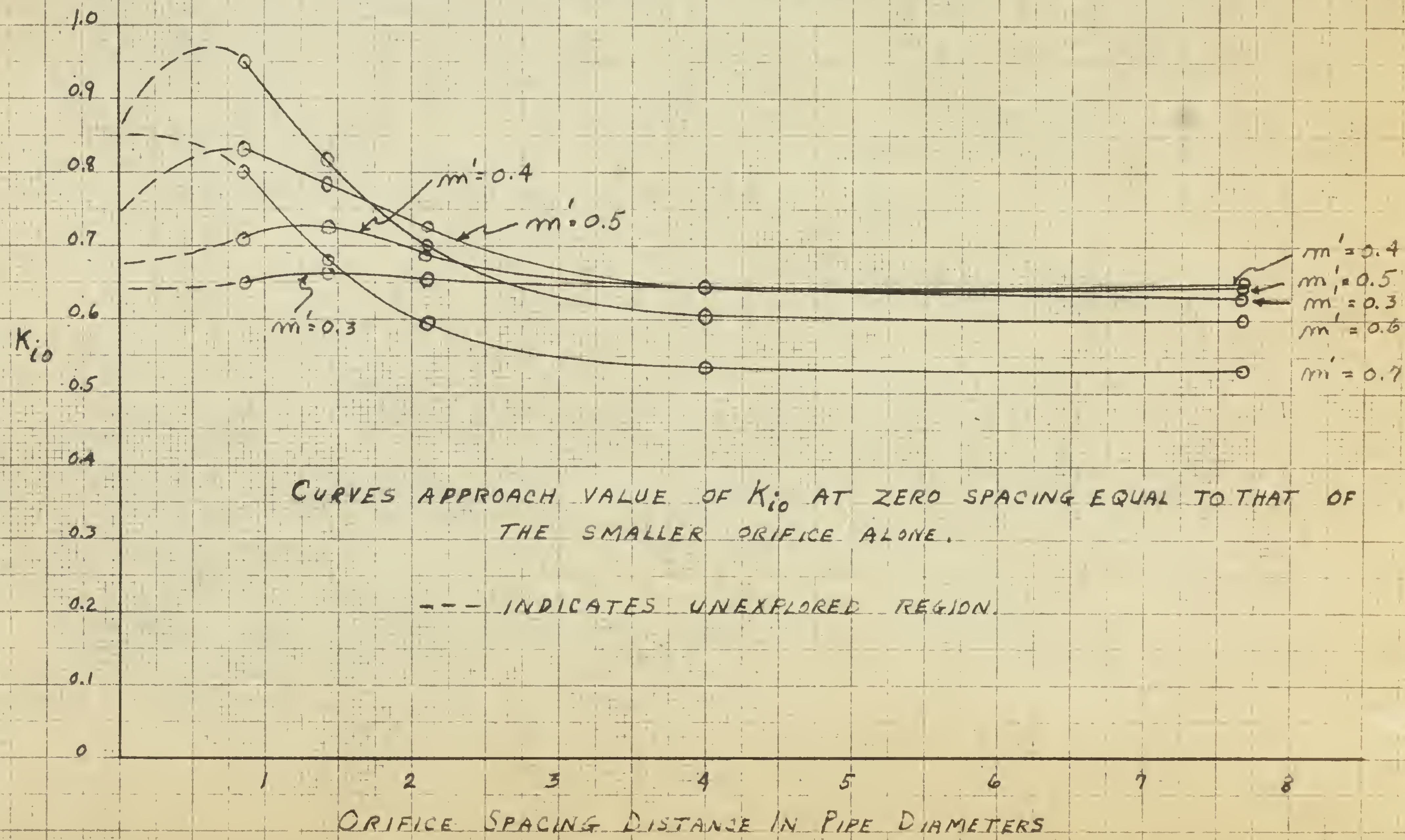


5/9/49
HED

FIGURE LV

DISCHARGE COEFFICIENT K_{io} VS. SPACING DISTANCE

$m'' = 0.6 \qquad R_E = 10^5$



5/9/49

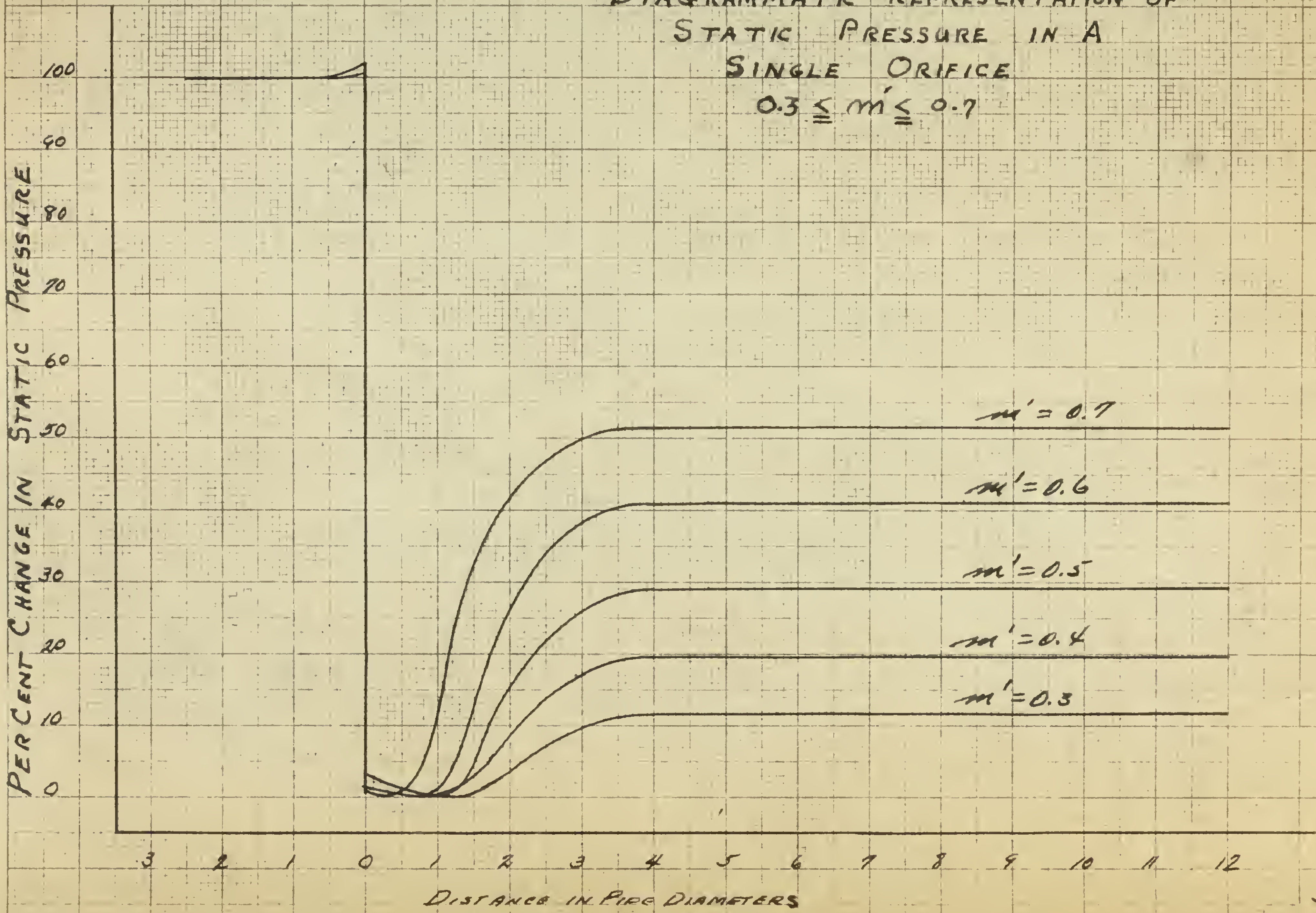
CURVES OF AXIAL

DISTRIBUTION OF STATIC

PRESSURE

FIGURE LVI

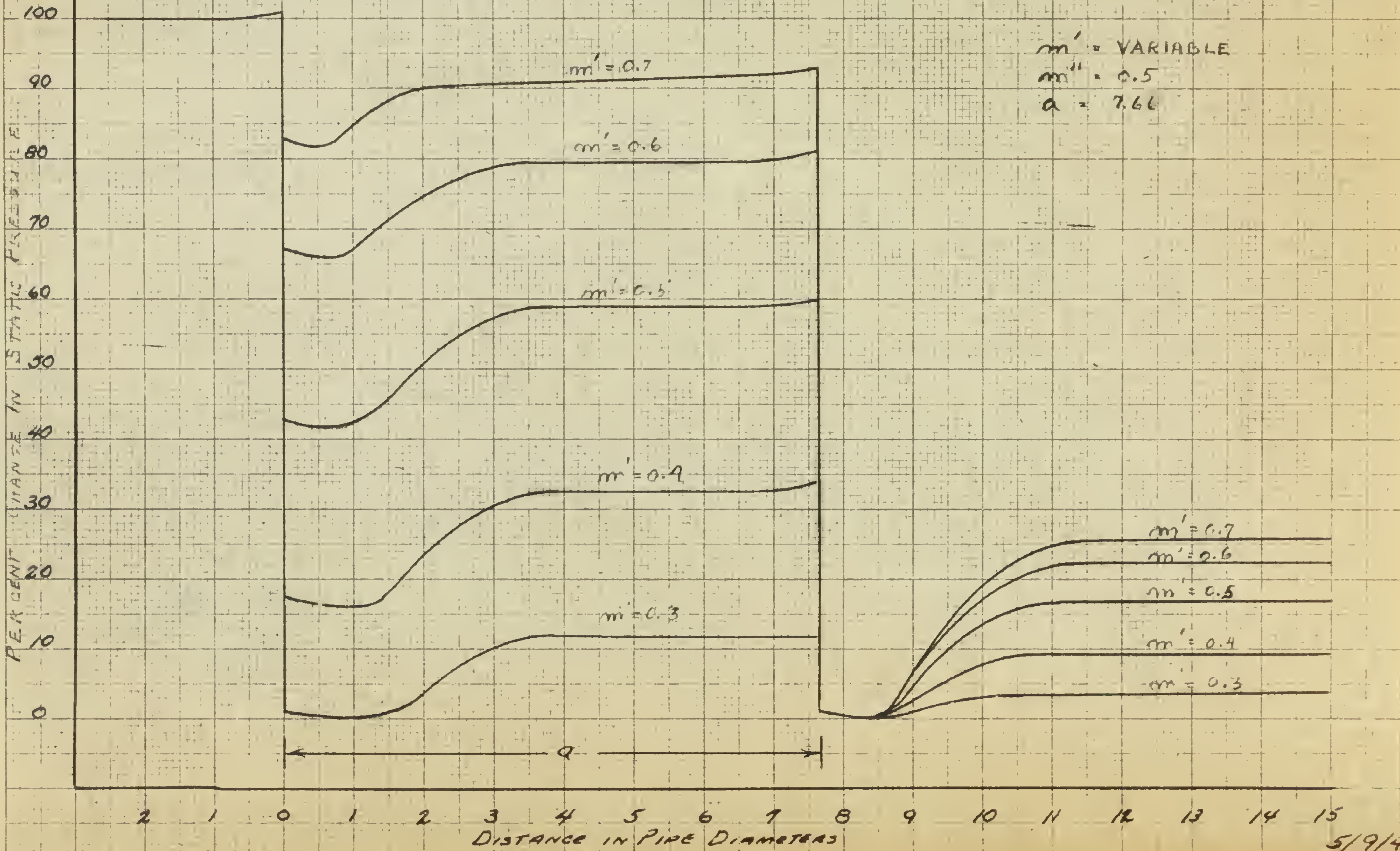
DIAGRAMMATIC REPRESENTATION OF
STATIC PRESSURE IN A
SINGLE ORIFICE
$0.3 \leq m' \leq 0.7$



5/49
W.E.D.

FIGURE LVII

AXIAL DISTRIBUTION OF STATIC PRESSURE
(DOUBLE ORIFICE)



5/9/49

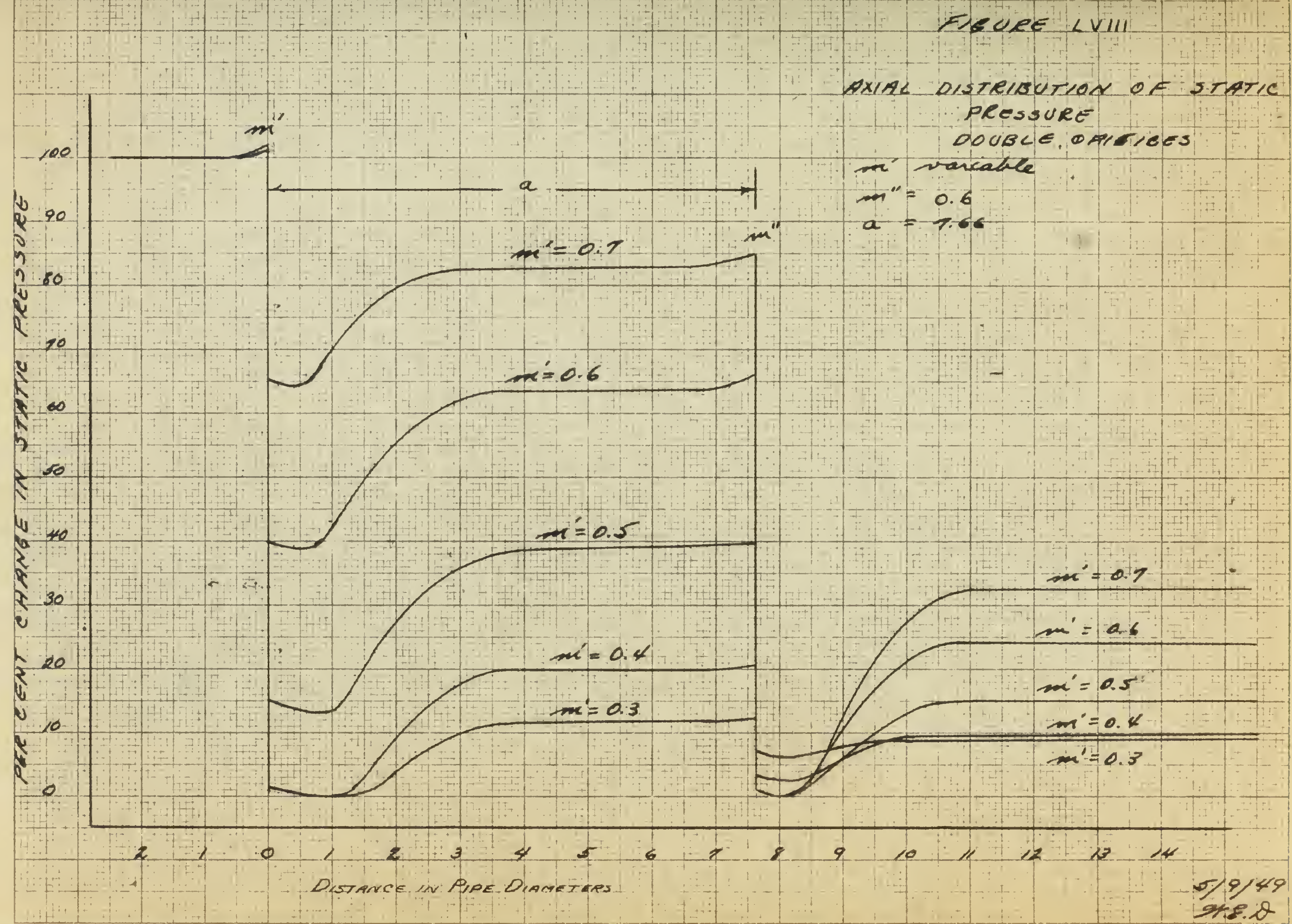


FIGURE LVIII
AXIAL DISTRIBUTION OF STATIC PRESSURE
DOUBLE ORIFICES
m' variable
m'' = 0.6
a = 7.66
m''
a
m' = 0.7
m' = 0.6
m' = 0.5
m' = 0.4
m' = 0.3
m' = 0.7
m' = 0.6
m' = 0.5
m' = 0.4
m' = 0.3
PER CENT CHANGE IN STATIC PRESSURE
100
90
80
70
60
50
40
30
20
10
0
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
DISTANCE IN PIPE DIAMETERS
5/9/49

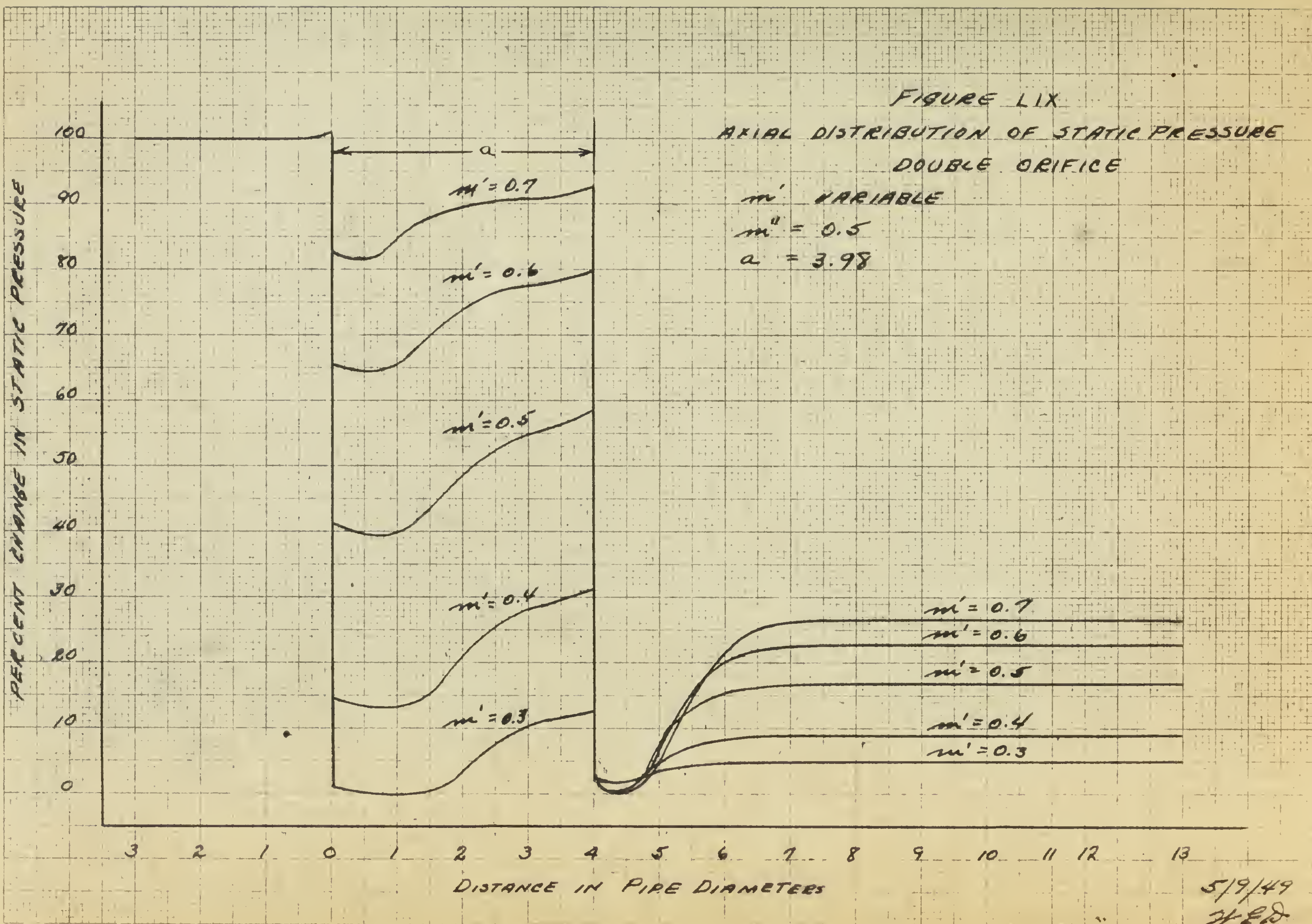
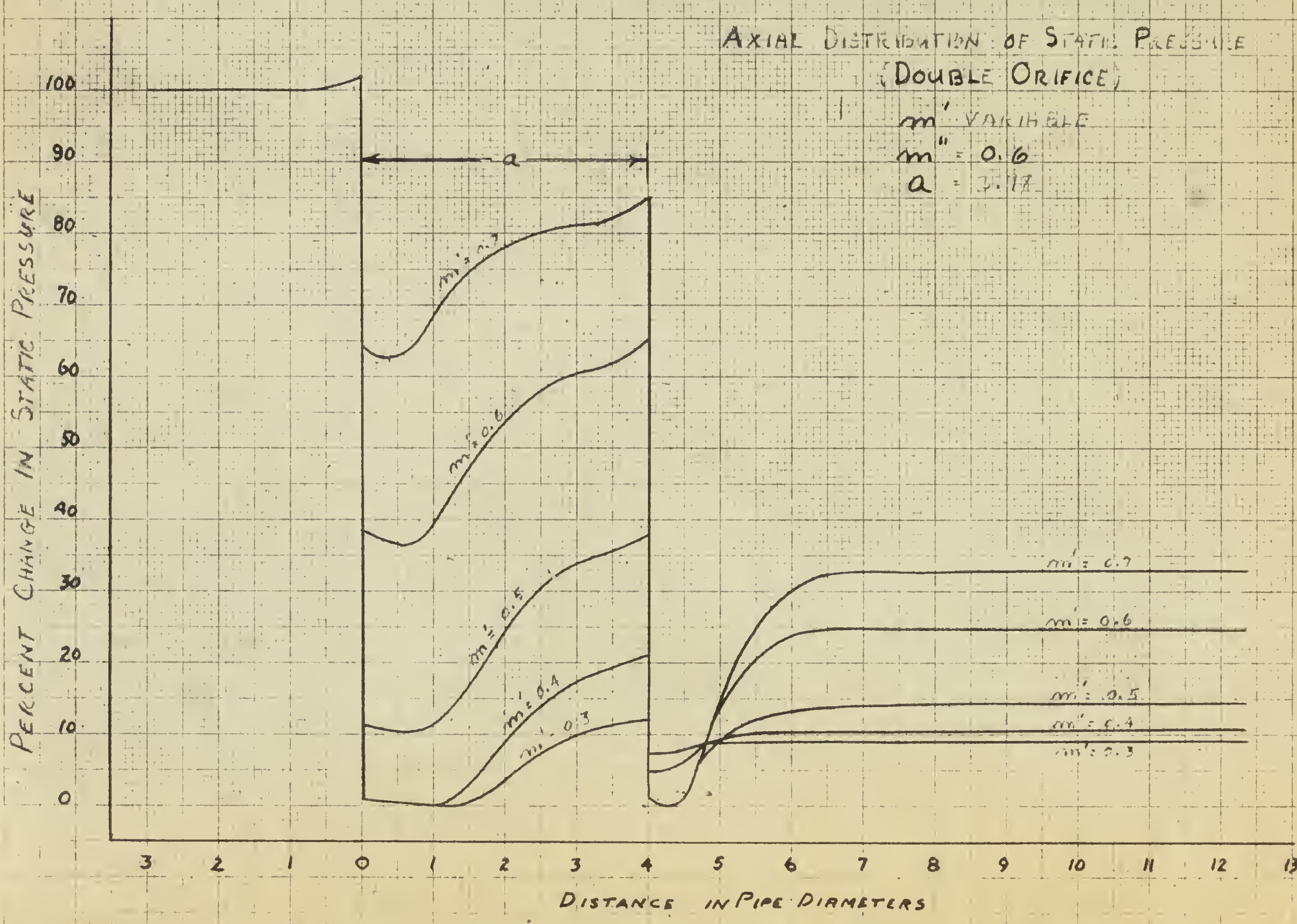


FIGURE LIX
AXIAL DISTRIBUTION OF STATIC PRESSURE
DOUBLE ORIFICE
m' VARIABLE
m'' = 0.5
a = 3.98
a
m' = 0.7
m' = 0.6
m' = 0.5
m' = 0.4
m' = 0.3
PERCENT CHANGE IN STATIC PRESSURE
100
90
80
70
60
50
40
30
20
10
0
3 2 1 0 1 2 3 4 5 6 7 8 9 10 11 12 13
DISTANCE IN PIPE DIAMETERS
5/9/49

FIGURE LX



5/9/49
H.E.R.

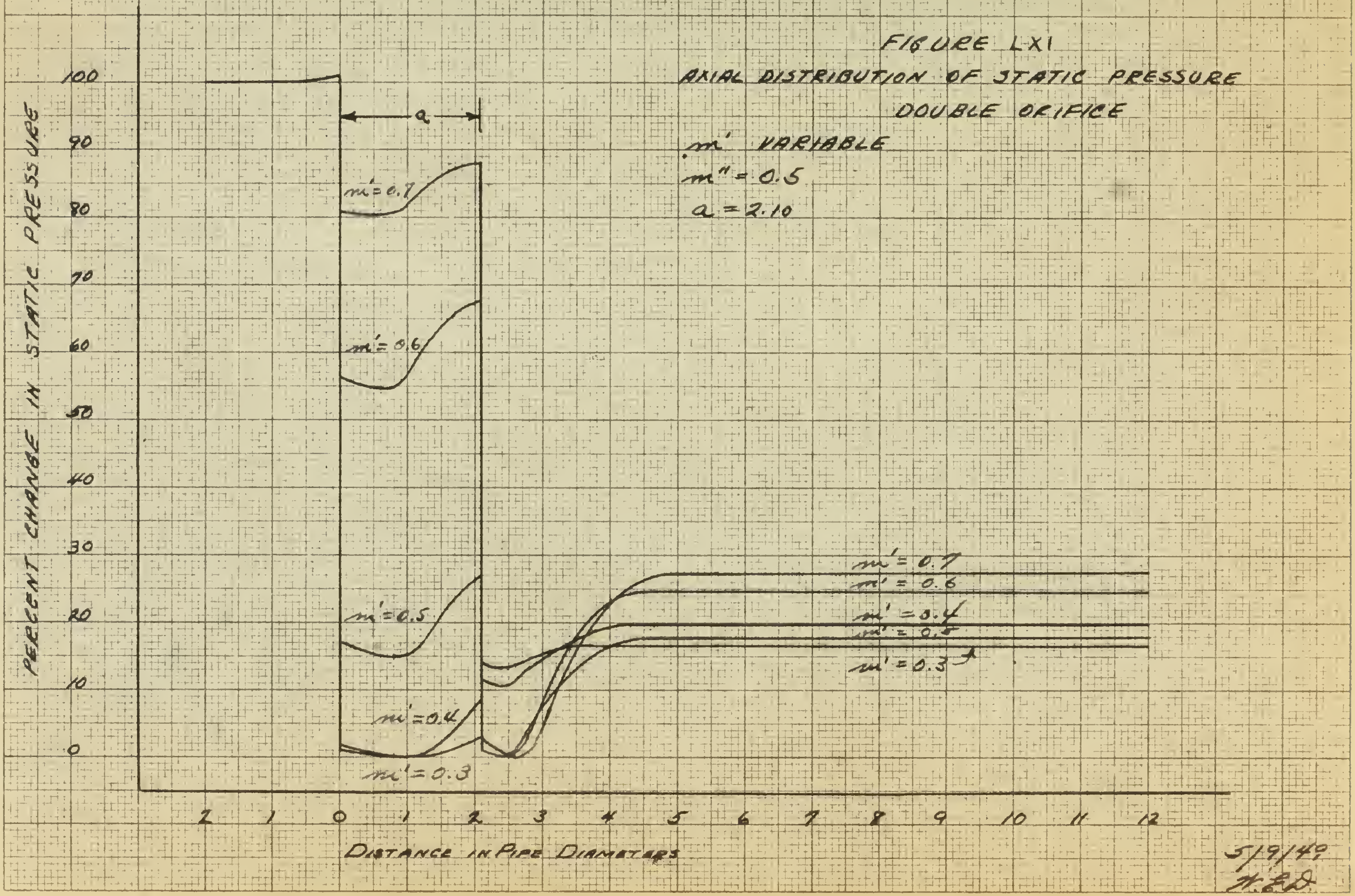


FIGURE LXI
AXIAL DISTRIBUTION OF STATIC PRESSURE
DOUBLE ORIFICE
m' VARIABLE
m" = 0.5
a = 2.10
a
m' = 0.7
m' = 0.6
m' = 0.5
m' = 0.4
m' = 0.3
m' = 0.7
m' = 0.6
m' = 0.4
m' = 0.5
m' = 0.3
PERCENT CHANGE IN STATIC PRESSURE
100
90
80
70
60
50
40
30
20
10
0
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
DISTANCE IN PIPE DIAMETERS
5/9/49

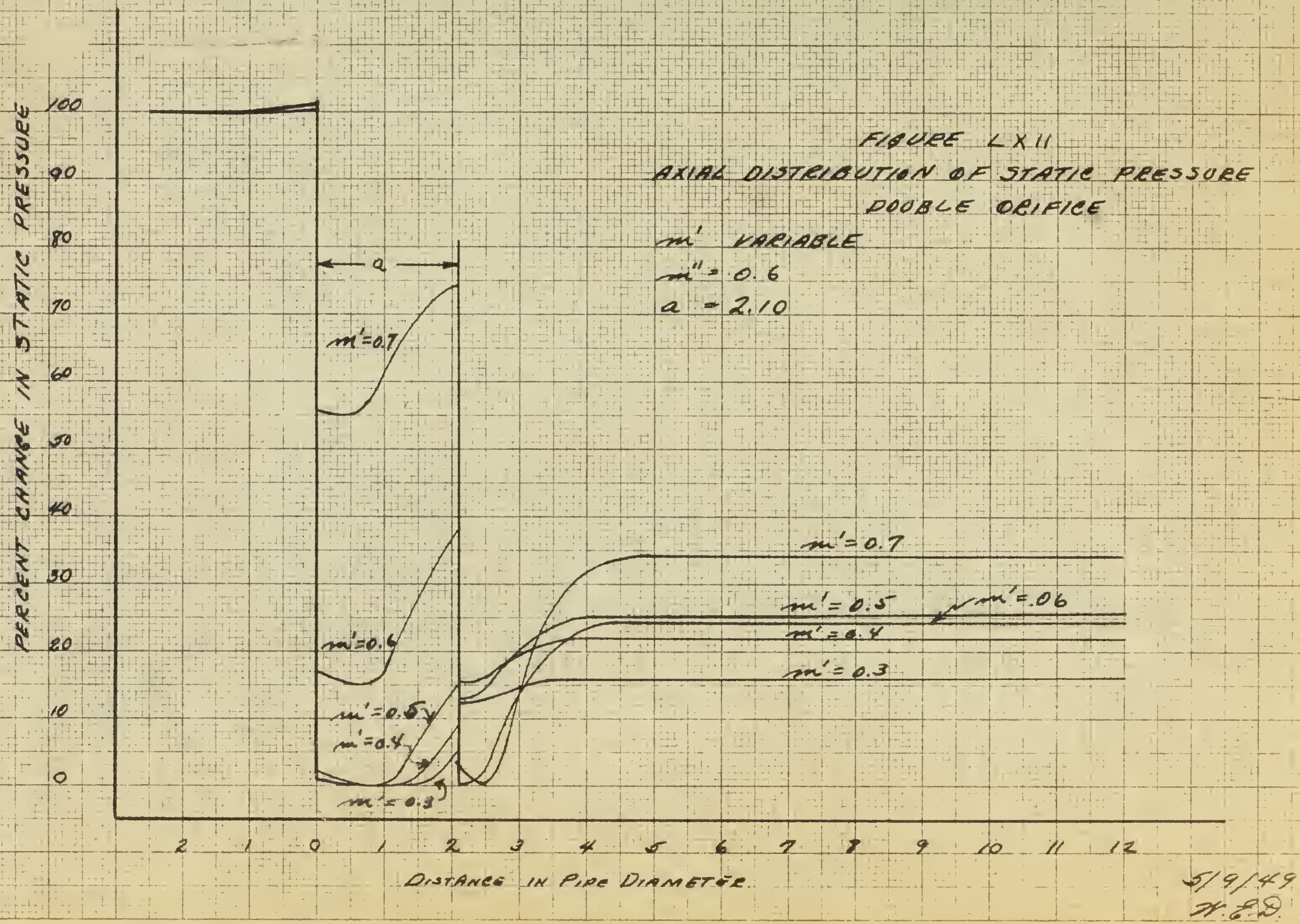


FIGURE LXII
AXIAL DISTRIBUTION OF STATIC PRESSURE
DOUBLE ORIFICE
m' VARIABLE
m'' = 0.6
a = 2.10
a
m' = 0.7
m' = 0.6
m' = 0.5
m' = 0.4
m' = 0.3
m' = 0.7
m' = 0.5
m' = .06
m' = 0.4
m' = 0.3
PERCENT CHANGE IN STATIC PRESSURE
100
90
80
70
60
50
40
30
20
10
0
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
DISTANCE IN PIPE DIAMETER
5/9/49
H.E.D.

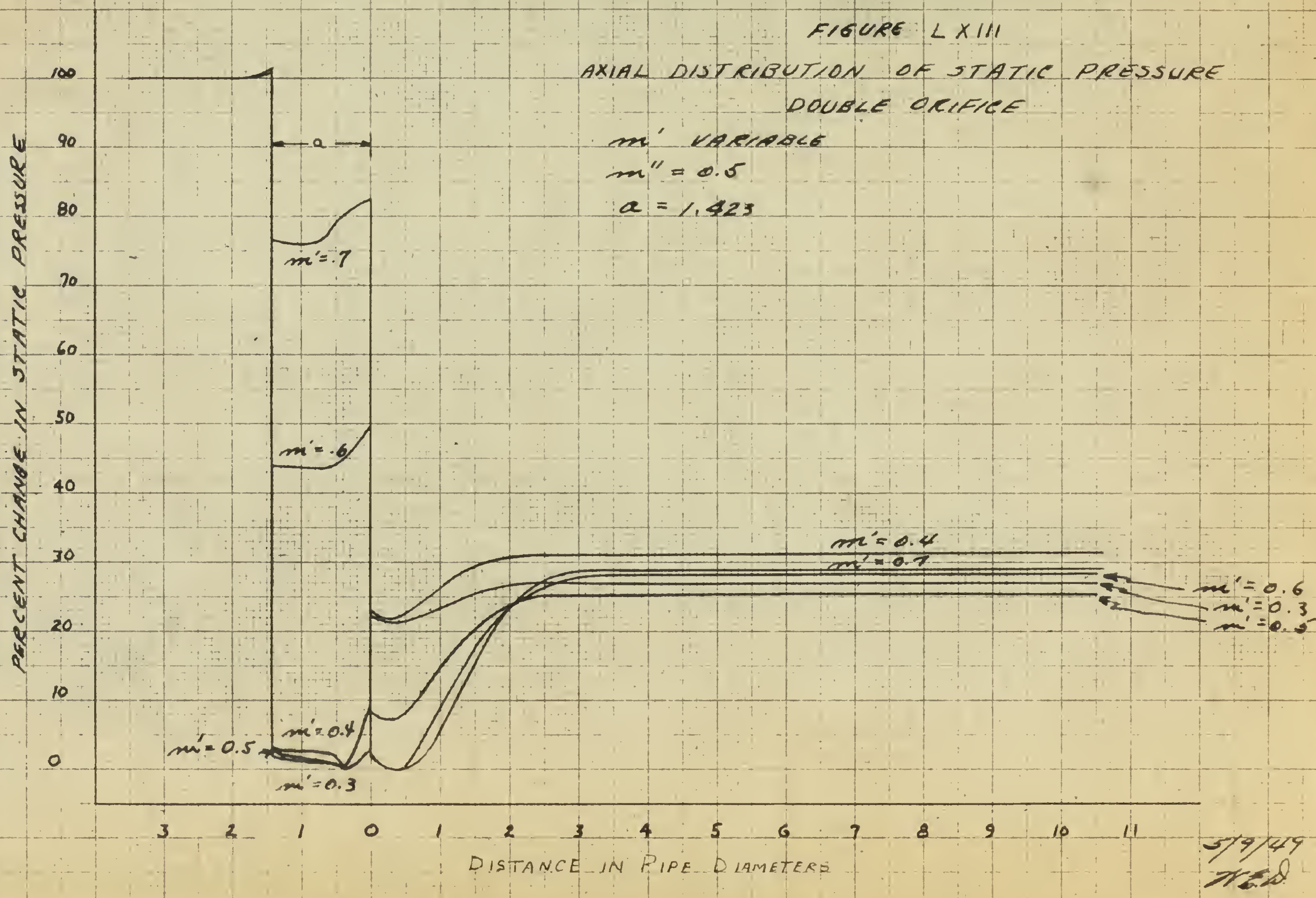
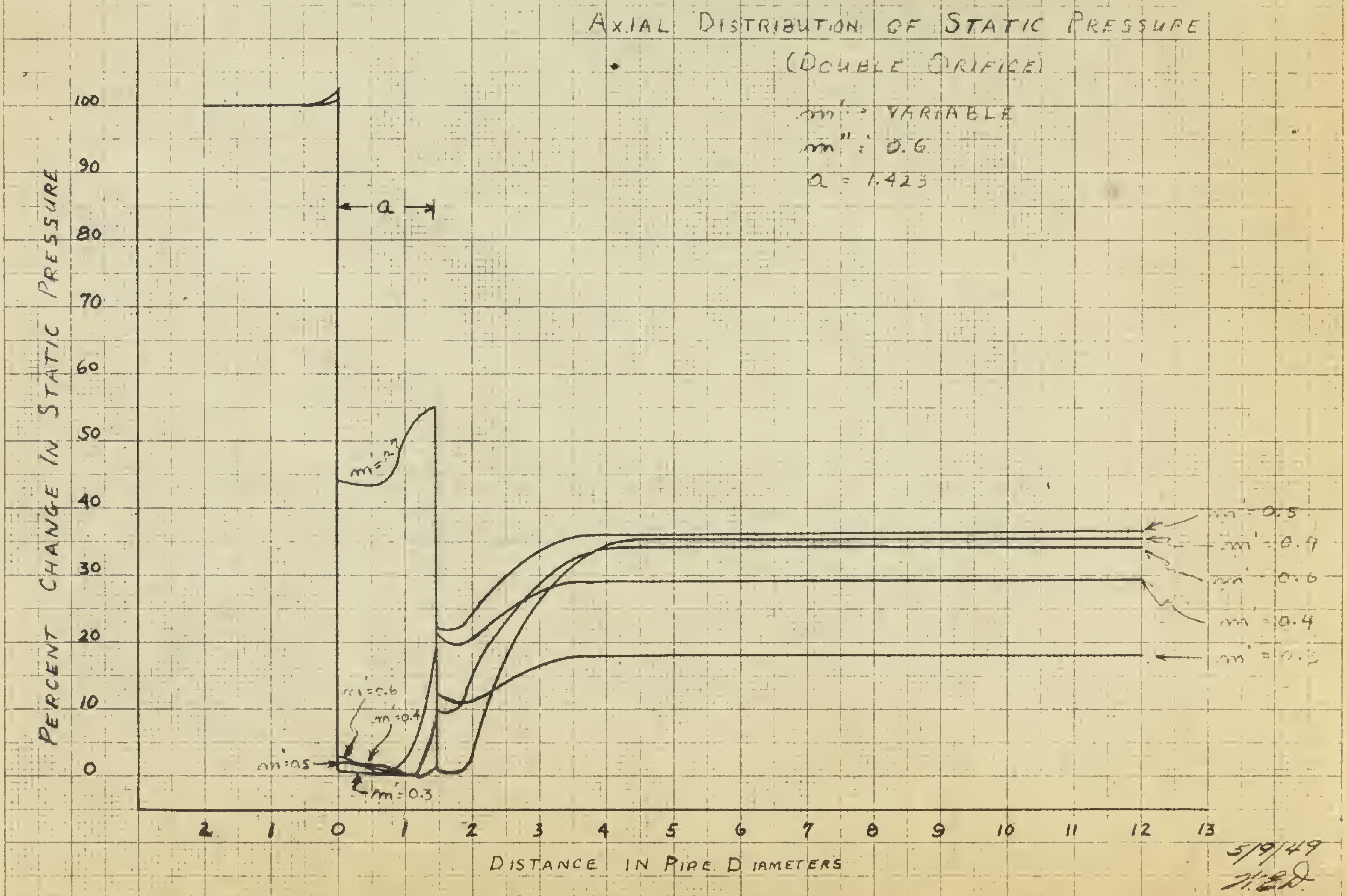


FIGURE LXIII
AXIAL DISTRIBUTION OF STATIC PRESSURE
DOUBLE ORIFICE
m' VARIABLE
m'' = 0.5
a = 1.423
a
m' = .7
m' = .6
m' = 0.4
m' = 0.5
m' = 0.3
m' = 0.4
m' = 0.7
m' = 0.6
m' = 0.3
m' = 0.5
PERCENT CHANGE IN STATIC PRESSURE
100
90
80
70
60
50
40
30
20
10
0
3
2
1
0
1
2
3
4
5
6
7
8
9
10
11
DISTANCE IN PIPE DIAMETERS
5/9/49

FIGURE LXIV


AXIAL DISTRIBUTION OF STATIC PRESSURE
(DOUBLE ORIFICE)
m' : VARIABLE
m'' : 0.6
a = 1.425
a
m' = 0.7
m' = 0.6
m' = 0.4
m' = 0.5
m' = 0.3
m' = 0.5
m' = 0.7
m' = 0.6
m' = 0.4
PERCENT CHANGE IN STATIC PRESSURE
100
90
80
70
60
50
40
30
20
10
0
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
DISTANCE IN PIPE DIAMETERS
5/9/49

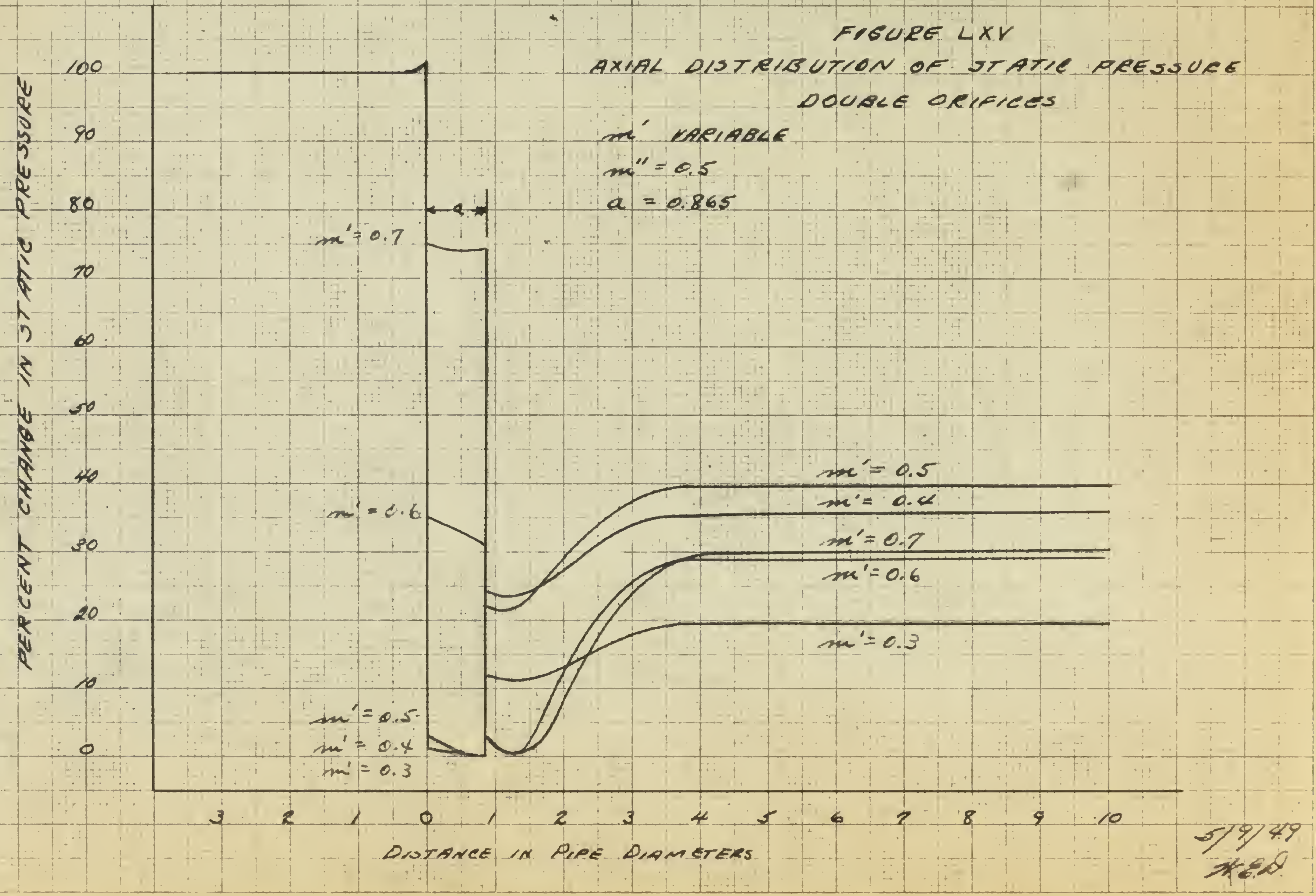
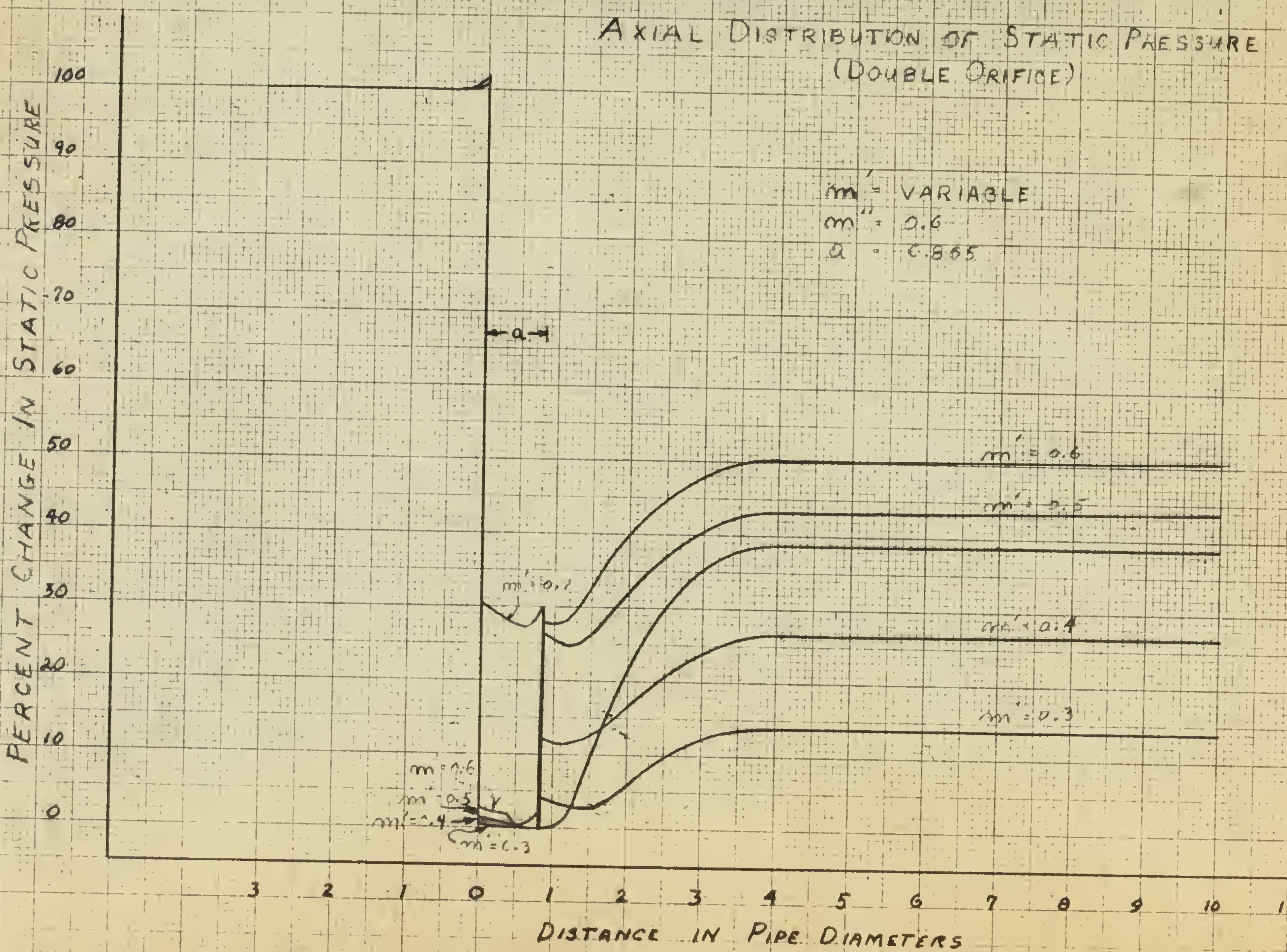


FIGURE LXV
AXIAL DISTRIBUTION OF STATIC PRESSURE
DOUBLE ORIFICES
m' VARIABLE
m'' = 0.5
a = 0.865
PERCENT CHANGE IN STATIC PRESSURE
100
90
80
70
60
50
40
30
20
10
0
a
m' = 0.7
m' = 0.6
m' = 0.5
m' = 0.4
m' = 0.3
m' = 0.5
m' = 0.4
m' = 0.7
m' = 0.6
m' = 0.3
3
2
1
0
1
2
3
4
5
6
7
8
9
10
DISTANCE IN PIPE DIAMETERS
5/9/49

FIGURE LXVI

AXIAL DISTRIBUTION OF STATIC PRESSURE
(DOUBLE ORIFICE)



5/9/49

<u>PRESSURE RECOVERY</u>

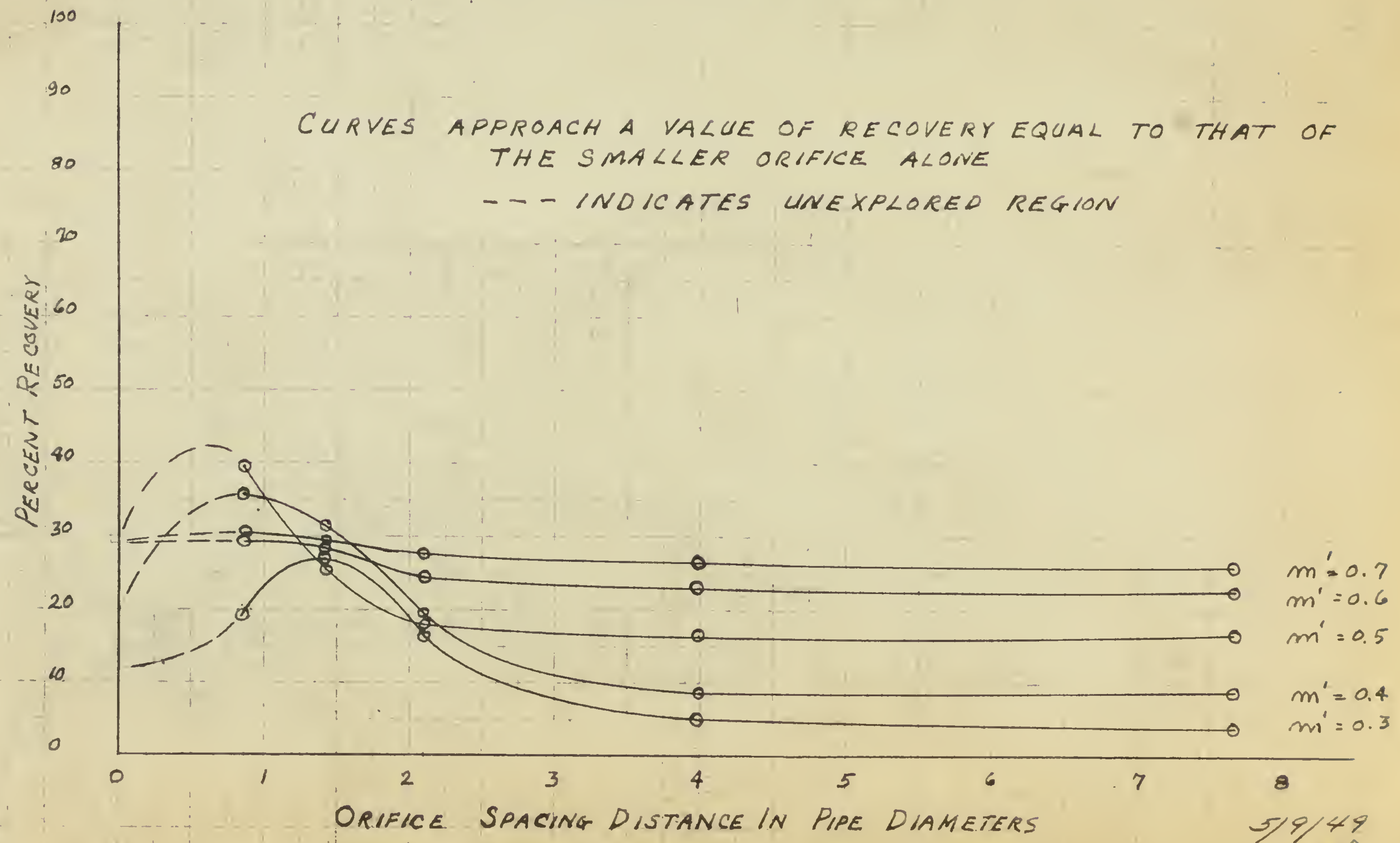
<u>VERSUS</u>

<u>SPACING DISTANCE</u>

FIGURE LXVII

PRESSURE RECOVERY VS. SPACING DISTANCE

$m'' = 0.5 \qquad R_E = 10^5$

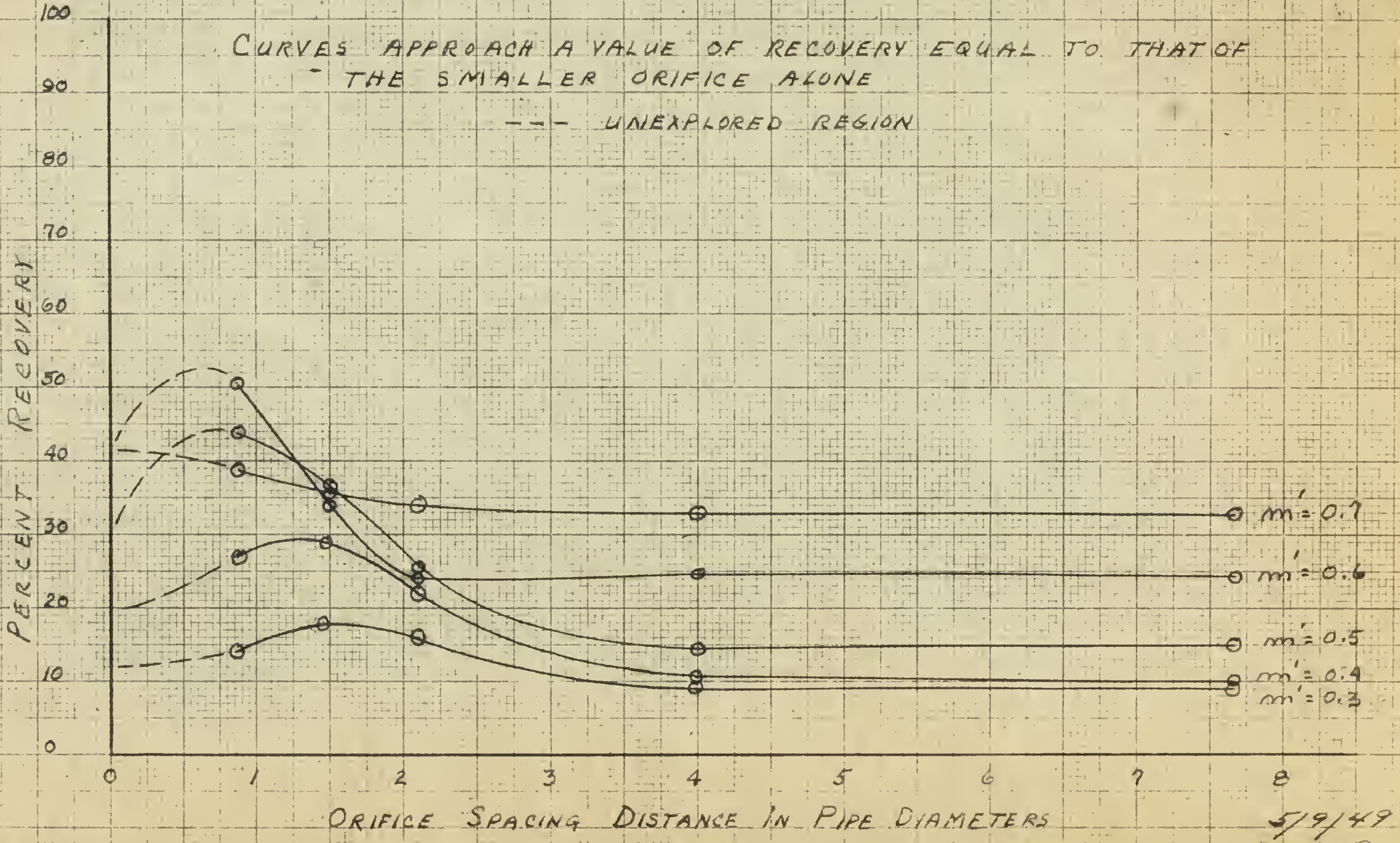


5/9/49
H.E.D.

FIGURE LXVIII

PRESSURE RECOVERY VS. SPACING DISTANCE

$m'' = 0.6 \quad R_E = 10^5$



5/9/49
H.E.D.

V. DISCUSSION OF RESULTS

The curves of Discharge Coefficients versus Reynolds Numbers shown in Figures IV-XXXVI indicate that the discharge coefficient based on any set of taps is practically independent of the Reynolds Number for the range investigated. These plots show the discharge coefficients of the two orifices in series based on three different sets of pipe taps. K_{12} is based on radius taps located one radius upstream and downstream from the first orifice plate. K_{14} is based on radius taps located one radius upstream from the first orifice plate and one radius downstream from the second (or downstream) orifice plate. K_{10} is based on pipe taps located 2½ pipe diameters upstream from the first orifice plate and 8 pipe diameters downstream from the second orifice plate. For the cases using the 0.3 pipe diameter orifice ratio upstream a departure from this trend is noted which can be attributed to the lack of precision in measuring low rates of flow. In all other cases, however, the curves are consistently straight and parallel to the abscissae.

The plots of Variation of Discharge Coefficient with Upstream Orifice Ratio shown in Figures XXXVII-L indicate that the coefficient of the upstream orifice K_{12} is independent of the distance between the orifice plates and the

size of the downstream orifice.

Figure LI and a comparison of Figure LII with Figures XLVII to XLVIII show that the K_{12} values for the single and double orifice combinations are the same. It is this fact that shows that the double orifice will always give the same available measuring head as the single orifice.

The K_{10} and K_{14} curves show a decided peak for low values of the axial spacing distance. This peak appears to occur when both the orifices are the same size.

The pressure at the radius tap after the downstream orifice is always less than that at the downstream pipe tap; hence the difference in pressure for the discharge coefficient, K_{14}, is always greater than that for K_{10}. Therefore, the K_{10} curve will always lie above the K_{14} curve.

It might be of interest to note what would happen when m approaches zero or one as a limit.

$$Q \propto K\sqrt{\Delta h}$$

WHEN $m \to 0$, THEN $Q \to 0$, AND Δh REMAINS FINITE

$$\therefore \; K_{m \to 0} \propto \frac{Q}{\sqrt{\Delta h}} \to 0$$

WHEN $m \to 1$, THEN Q REMAINS FINITE, BUT $\Delta h \to 0$

$$\therefore \; K_{m \to 1} \propto \frac{Q}{\sqrt{\Delta h}} \to \text{INFINITY.}$$

This development fixes the end points of these curves. Just how these curves vary outside the region shown is unknown, but it is considered that the range of greatest interest was covered in this investigation.

Figures LI - LV are cross curves which were constructed from Figures IV - XXXVI to illustrate the variation of Discharge Coefficient versus Orifice Spacing. From these curves it is evident that the range in which the distance between orifice plates is effective in improving the discharge coefficient lies within the four pipe diameter spacing distance. The discharge coefficient is extensively constant for spacing ratios greater than this value.

It is to be noted that the single orifice arrangement gives a higher discharge coefficient than does any double orifice combination studied in the spacing range greater than four diameters. Hence the double orifice is of doubtful value with spacing ratios greater than four diameters.

With spacing ratios less than four diameters the discharge coefficient tends to increase with decrease in spacing ratio. With upstream orifice size smaller than that of the downstream orifice, the discharge coefficient passes through a peak and terminates at zero spacing with the value the upstream orifice would have as a single orifice. With the upstream orifice sizes equal to or larger than the

downstream orifice, no peak was reached. However, the closest spacing used in the experiments was not adequate to define clearly the region below 0.356 pipe diameters. It is known only that the final value at zero spacing will be that corresponding to the smaller of the two orifices.

Figure LVI illustrates the average static pressure gradient in the vicinity of a single orifice. Close to the inlet side of the orifice the static pressure increases slightly and reaches its maximum value at the entrance to the orifice. The pressure drops abruptly as the fluid flows through the orifice, and on the outlet side the pressure continues to decrease slightly until a minimum value is reached. This minumum value known as the Vena Contracta point occurs a short distance beyond the orifice. (Ref. 4. - p. 35). Beyond the Vena Contracta the pressure increases slowly at first, then rapidly for a short distance, then again more slowly until its second maximum is reached. The static pressure curves were plotted on a percentage basis with unity representing the difference between the minimum pressure upstream and the minimum pressure reached within the system. When plotted in this manner the second maximum is equal to the per cent recovery. The percent loss is the difference between 100 percent and the percent recovery. The per cent loss expressed as a fraction is

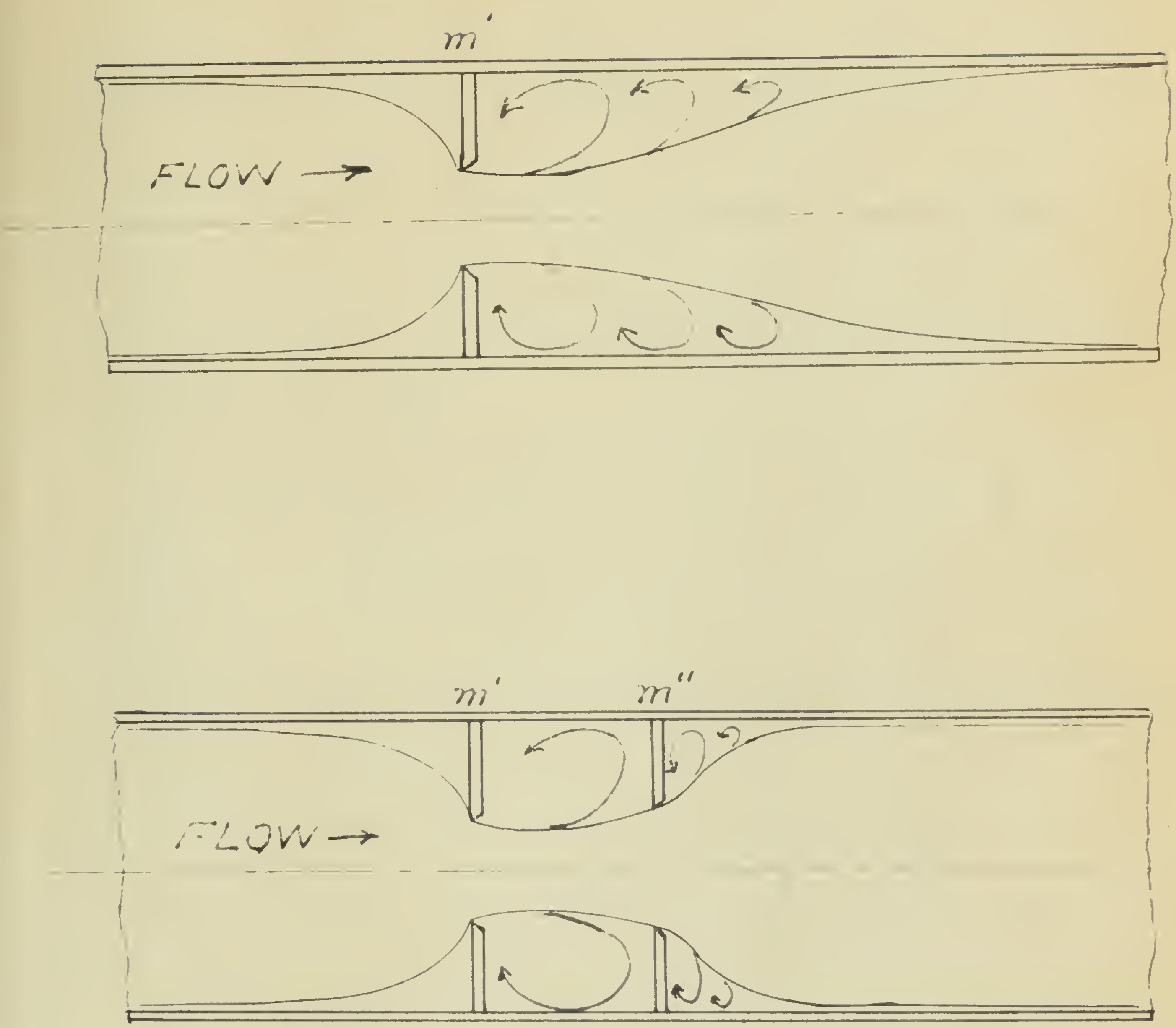
nearly equal to one minus the square of the orifice diameter ratio (Ref. 4.).

The maximum recovery for the single orifice was reached at about four pipe diameters regardless of orifice size. In testing the double orifice combination a much greater spacing ratio was used to verify the belief that an orifice placed at any greater distance downstream than that necessary for full recovery in a single orifice would act as another separate single orifice independent of any orifice located further upstream. This fact can be verified by looking at the m' = 0.5 curve of Figure LVII (or the m' = 0.6 curve of Figure LVIII). This shows that the per cent drop across the upstream orifice is equal to the per cent drop across the downstream orifice for equal sized orifices.

Figures LXI to LXIV show that an increase in pressure across an orifice is obtained when an orifice slightly smaller is placed upstream. Figures LXV and LXVI show that when the spacing is made smaller even an equal sized orifice upstream causes a pressure rise across the downstream orifice.

This pressure rise is interpreted as follows. The flow through any orifice contracts and expands as illustrated in the sketches of Figure LXIX. Whenever the downstream orifice closely approximates the size of the jet, a pressure rise across this orifice will occur. Those combinations which

FIGURE LXIX



produce a pressure rise across the second orifice attain their maximum pressure recovery in a shorter axial distance than that required by a single orifice. The second orifice creates a drag on the edge of the high velocity stream and causes the stream to diverge more rapidly than if it were left undisturbed. This divergence causes more rapid conversion of the kinetic energy into potential energy in the form of static pressure. This second orifice also confines and restricts the region of eddy motion produced by the upstream orifice.

The actual pressure curves delineated by the data obtained for any flow rate for any test setup were all similar in shape and, when plotted on a percentage basis, coincided. This similarity in shape is to be expected since the discharge coefficient is practically independent of Reynolds Number.

Figures LXVII and LXVIII are cross curves of the static pressure curves taken in the maximum recovery region downstream of the test section. They indicate orifice combinations and spacings that produce the best recovery for the same available measuring head.

The curves of Maximum Recovery versus Spacing Distance are similar to the curves of Discharge Coefficient versus Spacing Distance in that they both show increased values in the spacing range less than four pipe diameters.

These latter curves are useful in analyzing the merits of the double orifice because they indicate that the recovery of any single orifice can be improved without reducing its available measuring head. This can be done by placing an orifice downstream which is approximately the same size or larger than the first. As an example, assume that a 0.5 single orifice is to be installed to measure a certain range of flow rates with a particular range of measuring heads. Figures LXVII and LXVIII indicate that either a 0.5 or 0.6 orifice placed slightly less than one diameter downstream will give a higher recovery pressure with the same available measuring head across the first orifice. This example can be extended to illustrate that any single orifice can be improved by a proper double orifice combination.

VI. CONCLUSIONS

1. A pressure rise through the second orifice of a double orifice combination is obtained when the axial spacing between them is less than about 2.5 pipe diameters and when the first orifice diameter is approximately equal to or less than that of the second.

2. When the orifices are separated by more than about 4 pipe diameters both orifices act independent of each other; whereas the discharge coefficient of the upstream orifice is always independent of the downstream orifice size and location.

3. The discharge coefficient for the double orifice was independent of Reynolds Number in the range of investigation (4×10^4 to 2×10^5).

4. An increase in discharge rate through an orifice for the same flow head can be obtained by placing another orifice in series with it such that a pressure rise occurs across the second orifice.

5. A double orifice combination can be devised which will have the same available measuring head as a single orifice but with a smaller pressure loss. Standardized coefficients for the single orifice can be used for the upstream orifice since it has been shown to be independent of the spacing distance and the size of the downstream orifice.

VII. RECOMMENDATIONS

1. Further investigations should be made in the range of orifice spacings of zero to one pipe diameters.

2. It is suggested that in further studies other orifice combinations should be used, possibly holding the upstream size constant and varying the downstream size over a limited range.

3. In this investigation it was found that the centrifugal pump used caused slight pulsations in pressure; hence, it is recommended that a standpipe with constant head be used in future work.

4. It is recommended that flow measurements in the tests be made with two orifices so arranged that a broad range of flow can be measured. A small orifice to be used in measuring low rates of flow and a large one for high rates of flow. This arrangement should be easy to devise.

5. The test equipment should be made of some non-corrosive material.

6. It is suggested that photography be used to analyze the flow conditions. This would require the use of two-dimensional flow and its extrapolation to the three-dimensional case.

APPENDIX

LOCATION OF TAPS IN PIPE SECTIONS

Test Sections

All pipe tap distances are given in inches from the upstream flange face. When bolted together, the space between flange faces is 5/16". Orifice plates are 1/8" thick.

48 inch Section

Tap No.	Inches
1	0.22
2	1.30
3	2.23
4	3.23
5	4.25
6	5.23
7	6.23
8	9.30
9	15.27
10	27.27
11	36.3
12	42.33
13	46.27
14	47.33
15	48.31
16	49.47

36 9/16 inch Section

Tap No.	Inches
1	0.19
2	1.31
3	2.31
4	3.31
5	4.31
6	5.31
7	6.31
8	9.31
9	15.31
10	24.31
11	33.25
12	34.38
13	35.38
14	36.31

24 5/16 inch Section

Tap No.	Inches
1	0.31
2	1.125
3	2.19
4	3.19
5	4.19
6	5.19
7	6.19
8	9.13
9	15.25
10	18.25
11	21.25
12	22.19
13	23.25
14	24.25

12 5/8 inch Section

Tap No.	Inches
1	.34
2	1.31
3	2.31
4	3.31
5	4.31
6	5.31
7	6.31
8	9.31
9	10.31
10	11.31
11	12.31

6½ inch Section

Tap No.	Inches
1	.31
2	1.31
3	2.31
4	3.31
5	4.31
6	5.31
7	6.25

4 5/16 inch Section

Tap No.	Inches
1	.25
2	1.08
3	1.81
4	2.69
5	3.31
6	4.09

2¼ inch Section

Tap No.	Inches
1	.3125
2	1.03
3	1.62
4	2.37

Upstream Section
Length
Tap locations in
inches from the
flange face

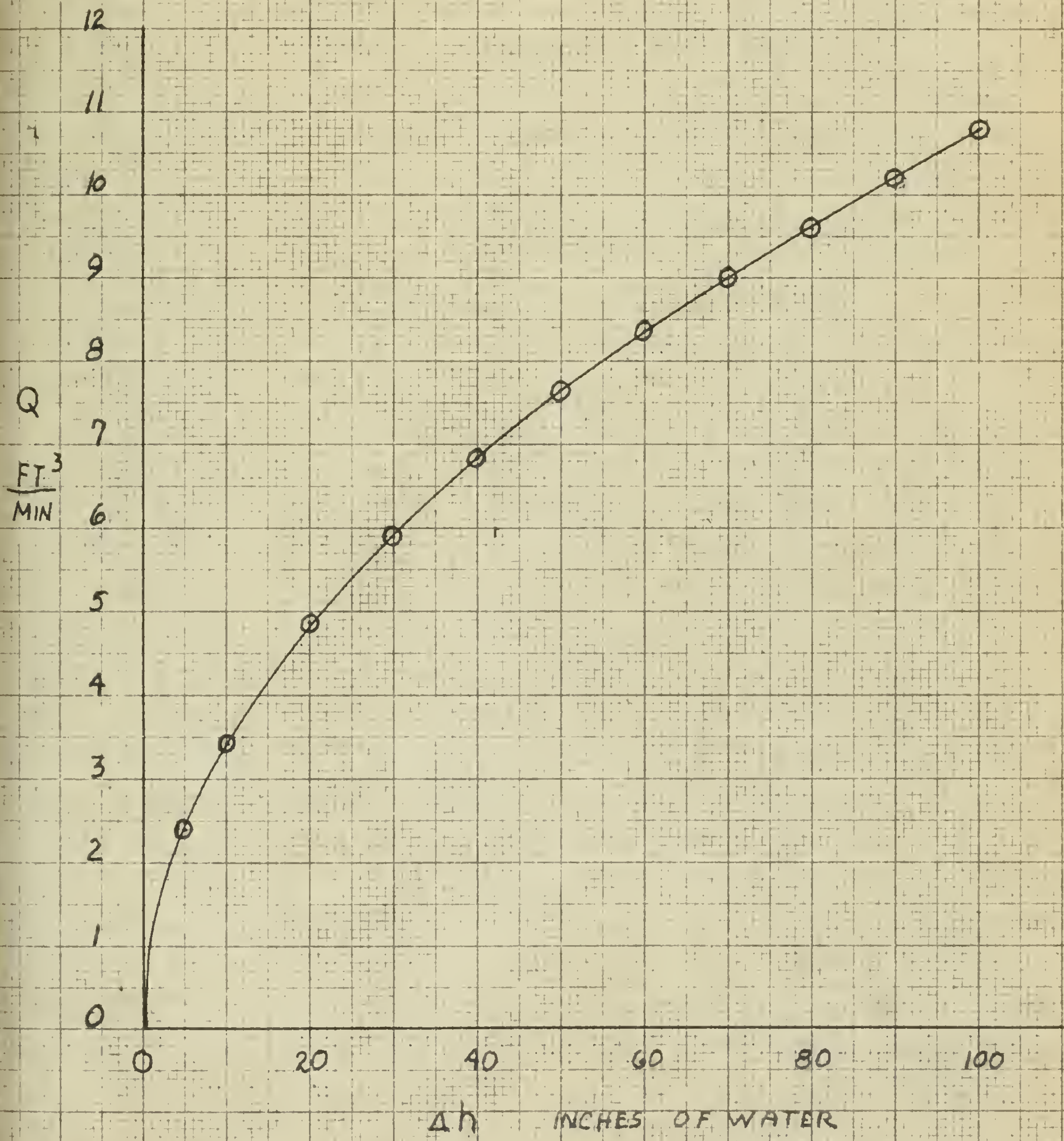
Tap No.	Inches
1	.30
2	2.44
3	3.45
4	10.33

Downstream Section
Length
Tap locations in
inches from the
flange face

Tap No.	Inches
1	.36
2	1.36
3	2.39
4	3.42
5	4.39
6	5.45
7	6.41
8	3.55
9	11.45
10	17.47
11	27.44

FIGURE [illegible]

FLOW MEASURING ORIFICE
CALIBRATION CURVE



SAMPLE CALCULATIONS

Discharge Coefficients, K:

$$Q = KA\sqrt{2g\Delta h} \qquad \text{(Cubic feet per minute)}$$

$$A = \frac{\pi D^2}{4} = \qquad \text{Area (square inches)}$$

$$K = \frac{Q}{\frac{\pi D^2}{4}\sqrt{2g\Delta h}} = \frac{\frac{ft^3}{min.} \times \frac{1728\, in^3}{ft^3} \times \frac{min}{60\, sec}}{in^2\sqrt{\frac{in}{sec^2}\ (in)}}$$

$$K = \frac{Q}{D^2\sqrt{\Delta h}} \times \frac{\frac{1728}{60}}{\frac{\pi}{4}\sqrt{2g}} = \frac{288}{0.786\sqrt{772}} = 1.319\frac{Q}{D^2\sqrt{\Delta h}}$$

Example

Q = 12 cubic feet per minute

m = 0.5 pipe diameter

D = 0.5 (3.25) = 1.625 inches

Δh = 92 inches of water

$$K = \frac{1.319(12)}{(1.625)^2\sqrt{92}} = \frac{1.319\ (12)}{2.64\ (96)} = 0.623$$

Reynolds Number, R_e:

$$R_e = \frac{VD}{\nu}$$

$$V = \frac{Q}{A}$$

$$R_e = \frac{QD}{A\nu} = \frac{\frac{ft^3}{min} \times in \times \frac{1728\,in^3}{ft^3} \times \frac{min}{60\,sec}}{in^2 \times \frac{ft^2}{sec.} \times \frac{144\,in^2}{ft^2}}$$

$$R_e = \frac{QD}{A\nu} \times \frac{1728}{60 \times 144} = \frac{QD}{\frac{\pi D^2}{4}\nu} \times 0.2 = 0.255\,\frac{Q}{\nu D}$$

Example

Q = 12 cubic feet per minute

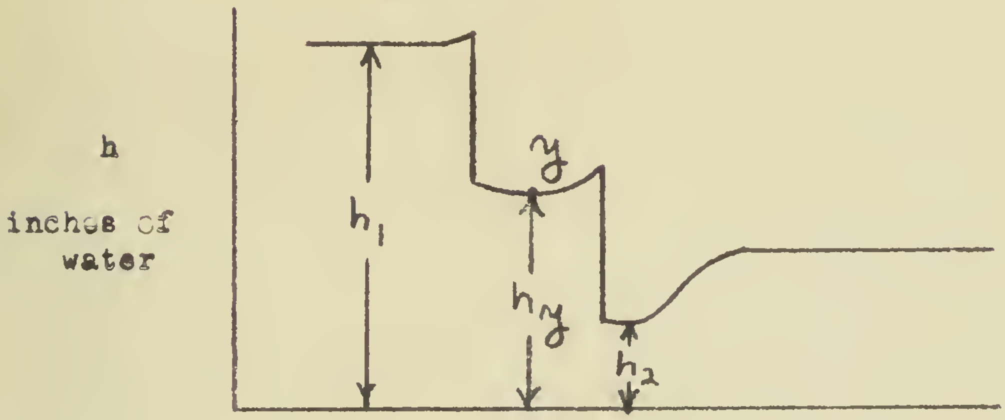
D = 1.625 inches

T = 74 degrees F

ν = 0.0000099 square feet per second for 74° F

$$R_e = \frac{0.255(12)}{0.99(10^{-5})(1.625)} = \frac{3.06}{1.61} \times 10^{-5} = 1.9 \times 10^{-5}$$

SAMPLE OF CALCULATION USED IN THE CONSTRUCTION OF THE CURVE OF VARIATION OF STATIC PRESSURE



Take $$\frac{h_1 - h_2}{h_y - h_2} \times 100 = 100\% \text{ change in static pressure}$$

Then the percent change at any point y, is

$$\frac{h_y - h_2}{h_1 - h_2} \times 100$$

For example,

$h_1 = 90$

$h_2 = 10$

$h_y = 60$

$$\frac{60 - 10}{90 - 10} (100) = 62.5\%$$

DATA

m' - a - m"
0.3 - 0.365 - 0.5

Pbar 29.907"Hg   Tw 75[illegible]

RUN

Tap	A	B	C	D	E
1	91.1	93.3	94.95	55.2	73.3
2	91.1	93.3	95.0	55.2	73.3
3	91.1	93.3	95.0	55.2	73.3
4	91.15	93.4	95.05	55.3	73.35
5	2.1	20.15	23.[illegible]	34.05	3[illegible].3
6	1.9	20.05	23.05	33.95	3[illegible].35
7	1.6	19.95	23.0	33.9	3[illegible].35
8	1.5	19.9	23.05	33.85	3[illegible].3
9	11.0	28.4	30.05	3[illegible].7	42.4
10	11.7	23.05	29.9	39.35	42.35
11	11.9	[illegible]	31.1	3[illegible].7	4[illegible].35
12	13.0	[illegible].1	31.9	40.3	42.75
13	14.4	30.4	32.1	41.[illegible]	43.45
14	16.1	31.3	33.3	4[illegible]	44.0
15	17.2	32.75	34.[illegible]	42.[illegible]	44.4
16	18.7	34.05	34.[illegible]	43.75	45.2
17	19.15	34.2	35.2	43.9	45.2
18	19.2	34.3	35.25	43.95	45.3
19	19.2	34.3	35.3	43.95	45.35
Phg	3.95	2.79	[illegible].73	2.09	1.97
Pflow	14.55	11.35	10.00	8.1	5.65
Qflow	4.13	3.73	3.42	3.07	2.57

[illegible] .4 = 0.365 = [illegible] .5

Pbar [illegible].92" Hg Tw 75[illegible]

Tap	A	B	C	D	E
1	[illegible]	[illegible]	71.35	[illegible]	55.3
2	[illegible]	[illegible]	71.35	[illegible]	55.3
3	[illegible]	[illegible]	71.35	[illegible]	55.3
4	[illegible]	[illegible]	71.45	62.95	[illegible]
5	[illegible]	16.0	27.7	[illegible]	37.6
6	[illegible]	[illegible]	27.6	32.9	[illegible]
7	1.75	16.35	27.4	[illegible]	37.5
8	[illegible]	16.2	27.45	32.9	37.55
9	23.2	34.0	[illegible]	40.3	41.55
10	22.9	33.75	[illegible]	40.2	[illegible]
11	23.7	34.5	[illegible]	40.45	41.95
12	25.6	36.0	[illegible]	41.0	[illegible]
13	27.9	37.7	40.6	41.7	[illegible]
14	30.0	39.6	41.4	42.65	43.2
15	31.5	40.5	42.2	43.0	43.5
16	33.3	42.1	43.1	43.6	[illegible]
17	34.0	42.5	43.3	43.75	44.0
18	34.1	42.6	43.4	[illegible]	44.0
19	34.2	42.7	43.45	[illegible]	44.05
Phg	[illegible]	[illegible]	2.10	[illegible]	2.01
Pflow	47.65	33.1	23.0	15.7	9.4
Qflow	7.46	6.06	5.13	4.29	3.32

a' - a - a"
0.5 - 0.365 - 0.5

Pbar 29.909 "Hg Tw 75°

Run

Tap	A	B	C	D	E	F
1.	34.1	75.3	65.4	58.5	44.0	91.6
2	34.1	75.3	65.4	58.5	44.0	91.6
3	34.1	75.3	65.4	58.5	44.0	91.6
4	34.[illegible]	75.7	65.6	58.7	44.05	92.0
5	19.6	2[illegible].05	30.95	36.0	36.7	3.6
6	18.3	24.6	30.6	35.[illegible]	36.6	2.4
7	18.3	24.3	30.3	35.6	36.6	1.8
8	17.1	23.4	35.7	35.2	36.6	1.4
9	32.0	34.9	37.6	40.3	38.1	20.5
10	32.2	34.9	37.6	40.3	38.1	20.7
11	34.2	36.[illegible]	38.6	40.[illegible]	38.35	23.4
12	36.4	38.7	39.9	41.8	38.65	27.0
13	38.8	40.25	41.1	42.7	38.9	30.0
14	40.3	41.7	4[illegible].2	43.3	39.1	32.35
15	42.[illegible]	42.6	43.1	43.9	39.3	34.5
16	43.7	44.1	43.9	44.3	39.4	36.6
17	44.1	44.3	44.0	44.4	39.5	37.2
18	44.1	44.35	44.0	44.45	39.5	37.3
19	44.3	44.45	44.1	44.5	39.55	37.5
Tgs	2.13	2.[illegible]	2.0	2.01	2.33	2.79
Pflow	38.	6[illegible].[illegible]5	47.45	38.[illegible]	5.95	---
Qflow	10.13	.93	7.44	5.0[illegible]	3.41	11.7[illegible]

m' - a - m"
0.6 - 0.365 - 0.5

Pbar 29.372"Hg   Tw 75F

Tap	Run A	Run B	Run C	Run D	Run E	Run F
1	92.4	69.7	61.7	55.45	50.1	44.5
2	92.3	69.7	61.7	55.4	50.1	44.5
3	92.4	69.75	61.7	55.4	50.1	44.5
4	93.7	70.2	62.15	55.65	50.3	44.65
5	31.6	40.2	40.15	40.15	40.7	41.0
6	30.7	39.9	40.05	40.0	40.55	40.9
7	30.0	39.75	39.85	39.8	40.4	40.85
8	29.2	39.4	39.4	39.4	40.3	40.85
9	1.0	26.1	29.9	32.75	36.15	39.2
10	0.2	25.7	29.65	32.5	36.1	39.15
11	3.8	27.3	30.8	33.45	36.7	39.3
12	9.7	30.1	32.9	35.05	37.6	39.6
13	14.6	32.7	34.6	36.15	38.3	40.0
14	19.2	34.9	36.3	37.45	39.05	40.2
15	22.4	36.2	37.25	38.15	39.75	40.45
16	26.0	38.1	38.6	39.0	40.1	40.65
17	27.15	38.5	38.95	39.15	40.25	40.75
18	27.25	38.5	38.9	39.2	40.25	40.7
19	27.65	38.7	39.1	39.55	40.35	40.75
Phg	3.59	2.77	2.67	2.63	2.61	2.58
Pflow	---	89.5	68.0	48.7	30.00	11.55
Qflow	14.975	10.17	8.37	7.53	5.90	3.68

h' - a - h''
[illegible].7 - 0.065 - 0.[illegible]

Port [illegible].?7" [illegible]   T [illegible] 75[illegible]

Tap	A	B	C	D	E	F
1	93.1	68.45	61.4	59.4	53.[illegible]	54.6
2	93.05	68.4	61.35	59.4	53.[illegible]	54.6
3	93.1	68.4	61.35	59.45	53.2	54.6
4	93.3	69.0	61.7	59.0	53.35	54.7
5	69.4	55.3	50.9	52.0	43.95	52.95
6	69.1	55.15	50.8	51.95	43.[illegible]	52.95
7	6[illegible].9	[illegible]5.05	50.75	51.95	43.[illegible]	52.95
8	63.6	54.3	50.5	51.[illegible]	43.75	52.95
9	0.5	17.2	31.7	31.35	36.5	43.3
10	0.0	16.3	31.4	31.15	36.45	43.15
11	0.[illegible]	17.2	32.0	31.25	36.6	43.3
12	5.9	20.1	24.[illegible]	33.1	37.7	43.7
13	11.[illegible]	23.3	26.[illegible]	34.7	3[illegible].5	45.05
14	16.9	26.2	28.9	36.3	39.5	45.[illegible]
15	20.5	28.4	30.5	37.5	40.3	45.65
16	25.9	31.2	3[illegible].[illegible]	39.0	41.2	50.0
17	27.9	32.35	33.6	39.7	41.6	50.2
18	28.15	32.4	33.6	39.[illegible]	41.65	50.2
19	28.55	32.6	33.75	39.9	41.7	50.25
Fhg	3.40	3.09	3.03	2.57	[illegible].55	1.79
Fflow	---	94.15	71.95	51.2	30.5	11.7
flow	14.02	10.43	9.11	7.72	5.94	3.70

m'	-	a	-	m"
0.3	-	0.365	-	0.6

Pbar 29.921"Hg　　　　Tw 75F

RUN

Tap	A	B	C	D	E
1	[illegible]	93.0	92.5	84.9	77.6
2	[illegible]	93.0	92.5	84.95	77.6
3	[illegible]	93.0	92.55	84.95	77.6
4	[illegible]	93.1	92.7	85.15	77.7
5	1.25	13.35	27.3	30.0	32.45
6	1.1	13.2	27.2	29.9	32.4
7	0.95	13.1	27.1	29.3	32.35
8	1.0	13.0	27.05	29.75	32.35
9	5.4	16.8	30.3	32.7	34.4
10	[illegible]	16.3	29.9	32.35	34.2
11	5.1	16.3	30.3	32.5	34.35
12	6.4	17.9	31.1	33.2	35.2
13	[illegible]	19.5	32.55	34.55	36.1
14	10.3	21.3	33.35	35.6	37.1
15	11.9	22.4	35.0	36.45	37.9
16	13.4	23.9	36.1	37.5	[illegible]
17	13.7	24.3	36.4	37.7	38.75
18	13.75	24.35	36.5	37.8	[illegible]
19	13.8	24.4	36.52	[illegible]	[illegible]
Phg	4.31	3.50	2.61	2.45	2.46
Pflow	[illegible]	13.0	10.6	3.9	7.25
Qflow	4.17	3.9	3.52	3.22	2.90

m' - a - m"
0.4 - 0.865 - 0.6

Pbar 29.92"Hg Tw 75F

	RUN				
Tap	A	B	C	D	E
1	93.9	91.1	32.1	70.45	59.3
2	93.9	91.1	32.1	70.45	59.3
3	93.9	91.65	32.1	70.45	59.3
4	94.4	91.35	32.35	70.65	59.4
5	0.3	15.9	23.35	23.55	33.7
6	0.6	15.35	23.2	23.45	33.65
7	0.[illegible]5	15.65	23.1	23.35	33.6
8	0.0	15.4	22.9	23.1	33.55
9	11.1	24.4	30.35	33.35	37.0
10	10.9	24.0	30.35	33.65	37.3
11	12.2	25.15	31.2	34.05	37.2
12	14.35	26.9	32.4	35.0	37.3
13	17.1	29.15	33.9	36.3	38.6
14	19.7	31.25	35.3	37.55	39.2
15	21.7	32.7	37.1	38.4	39.8
16	23.2	34.8	38.6	38.90	40.5
17	24.3	35.35	39.1	39.3	40.65
18	25.0	35.5	39.1	39.35	40.7
19	25.1	35.6	39.15	39.9	40.75
Phg	3.33	2.67	2.40	2.32	2.27
Pflow	4[illegible].7	39.75	30.9	22.0	13.45
Qflow	7.54	6.30	5.90	3.07	3.96

m' - a - m''

[illegible] - [illegible] - [illegible]

Pbar [illegible]

Tap	A	B	C	D	E	F
1	[illegible]	[illegible]	[illegible]	[illegible]	51.5	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	44.9
3	[illegible]	[illegible]	[illegible]	[illegible]	51.5	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	51.7	[illegible]
5	1.7	11.3	17.2	[illegible]	[illegible]	[illegible]
6	1.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	34.3
8	[illegible]	[illegible]	17.1	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]	35.2	[illegible]
10	[illegible]	[illegible]	29.5	[illegible]	35.05	37.05
11	[illegible]	[illegible]	31.1	[illegible]	35.7	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	36.4	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	37.3	[illegible]
14	34.7	[illegible]	36.1	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	37.3	37.3	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	39.2	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	39.1	[illegible]
Phs	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.43
Pflow	---	[illegible]	71.1	[illegible]	[illegible]	14.25
flow	[illegible]	[illegible]	9.06	7.5	5.92	[illegible]

m' - a - m"
0.6 - 0.865 - 0.6

Pbar 29.955"Hg Tw 75F

RUN

Tap	A	B	C	D	E	F
1	90.7	76.9	56.5	52.6	71.6	67.0
2	90.6	76.8	56.45	52.55	71.6	67.0
3	90.65	76.9	56.45	52.60	71.9	67.0
4	92.5	78.1	56.95	53.0	56.[illegible]	67.1
5	4.0	13.9	28.4	30.95	56.75	61.25
6	3.3	13.5	28.2	30.85	56.35	61.2
7	1.4	12.2	27.6	30.4	56.50	61.1
8	2.7	12.8	27.8	30.6	60.6	61.1
9	26.0	30.0	35.5	36.5	60.8	62.75
10	26.7	30.[illegible]	35.3	36.7.	61.7	62.8
11	31.7	34.6	37.4	3[illegible].0	62.4	63.1
12	35.4	37.4	38.7	39.1	62.95	63.4
13	39.0	3[illegible].7	39.8	39.7	63.35	63.65
14	41.7	41.4	40.6	40.4	63.75	63.[illegible]
15	43.8	42.9	41.2	40.8	64.1	64.0
16	45.3	44.5	41.9	41.4	64.5	64.15
17	46.3	44.9	42.15	41.55	64.6	64.2
18	46.2	44.65	42.1	41.6	64.5	64.2
19	46.3	45.15	42.3	41.7	64.65	64.2
Phg	2.73	2.63	2.30	2.45	0.57	0.56
Pflow	---	---	89.4	69.25	46.35	1[illegible].4
Qflow	17.3	15.5	10.16	8.94	7.36	4.65

m' - a - m''
0.7 - 0.305 - 0.6

Pbar 29.9[illegible]"Hg   Tw 75F

R[illegible]

Tap	A	B	C	D	E
1	34.9	69.9	53.7	62.4	59.7
2	34.7	6[illegible].05	53.7	6[illegible].4	59.7
3	34.35	69.[illegible]	53.7	62.4	59.7
4	37.15	71.2	54.2	6[illegible].7	59.9
5	35.2	35.9	40.3	[illegible].95	55.8
6	34.7	3[illegible].3	40.2	54.5	55.75
7	34.3	3[illegible].52	40.1	54.35	55.70
8	3[illegible].5	3[illegible].[illegible]	40.2	55.0	55.90
9	1[illegible].1	26.9	35.1	[illegible].1	54.35
10	15.3	27.3	35.75	52.2	54.30
11	[illegible].7	31.8	37.1	53.2	54.9
12	27.3	35.0	38.5	54.0	55.3
13	3[illegible].7	38.1	40.0	54.35	55.65
14	36.0	39.9	40.75	55.25	55.95
15	3[illegible].7	41.5	41.4	55.65	56.15
16	41.5	43.3	42.2	56.[illegible]	56.34
17	42.1	43.7	4[illegible].4	56.15	56.45
18	41.9	43.45	[illegible].35	56.05	56.4
19	4[illegible].7	44.0	4[illegible].35	56.15	56.45
Phg	3.64	2.73	2.31	1.15	1.23
Pflow	---	---	93.6	54.15	37.46
flow	16.1	15.77	10.41	7.[illegible]	5.64

m' - a - m"
0.3 - 1.423 - 0.5

Pbar 29.634"Hg Tw 75F

Tap	RUN A	B	C	D	E
1	93.4	89.0	89.6	79.6	69.9
2	93.4	89.0	89.6	79.6	69.9
3	93.4	89.0	89.6	79.6	69.9
4	93.5	89.1	89.7	79.7	69.95
5	3.6	12.2	29.35	33.2	36.[illegible]
6	3.4	12.1	29.25	33.05	36.8
7	3.35	12.0	29.25	33.0	36.3
8	3.1	11.9	29.1	32.95	36.6
9	2.2	10.9	28.35	32.5	36.25
10	4.3	13.75	29.3	33.4	37.05
11	19.6	26.1	40.3	41.3	42.7
12	19.4	25.6	39.9	41.1	42.55
13	20.0	26.15	40.4	41.4	42.8
14	21.1	27.15	41.25	42.2	43.3
15	22.3	28.3	41.9	42.7	43.7
16	23.3	29.25	42.55	43.4	44.1
17	23.9	29.6	42.9	43.6	44.3
18	24.25	29.85	43.2	43.9	44.3
19	24.35	30.0	43.25	43.95	44.5
20	24.30	30.0	43.3	43.95	44.5
21	24.35	30.05	43.3	44.0	44.55
Phg	3.50	3.09	2.05	1.97	1.93
Pflow	14.6	12.45	9.35	7.5	5.35
Qflow	4.14	3.32	3.40	2.96	2.47

m' - a - m"
0.4 - 1.403 - 0.5

Pbar 29.667"Hg Tw 75°

Q.M

Tap	A	B	C	D	E
1	92.5	33.3	31.9	69.0	53.5
2	92.5	33.3	31.9	69.0	53.5
3	92.5	33.3	31.9	69.0	53.5
4	92.[illegible]	33.65	32.05	69.1	53.55
5	5.9	12.3	26.3	32.4	37.5
6	5.7	12.5	26.6	32.2	37.5
7	5.[illegible]	12.65	26.7	32.2	37.3
8	5.3	12.15	26.25	31.9	37.05
9	3.4	10.40	25.2	31.3	36.[illegible]
10	[illegible].3	15.6	29.6	34.0	3[illegible].[illegible]
11	23.5	23.1	37.6	39.5	41.5
12	23.3	27.9	37.5	39.35	41.5
13	24.5	29.4	39.3	40.2	41.55
14	26.5	31.0	40.0	41.1	42.6
15	[illegible].7	32.6	41.0	41.3	42.9
16	30.1	33.3	41.7	42.4	43.2
17	30.9	34.6	42.3	42.75	43.3
18	31.3	35.2	42.7	42.95	43.35
19	31.35	35.5	42.7	43.0	43.35
20	31.1	35.[illegible]	42.75	43.0	43.3
21	31.[illegible]	35.3	42.[illegible]	43.0	43.35
PhC	3.0	2.64	2.16	2.12	2.09
%flow	45.55	40.0	29.5	19.25	11.15
flow	7.39	6.93	5.79	4.75	3.61

m' - a - m"
0.5 - 1.4 3 - 0.5

Pbar 29.644"Hg Tw 75F

RUN

Tap	A	B	C	D	E	F
1	90.3	31.1	69.1	5[illegible].9	50.2	93.4
2	90.35	31.1	69.05	53.35	50.2	93.4
3	90.35	31.1	69.1	53.35	50.2	93.5
4	90.8	31.3	69.4	59.10	50.25	94.20
5	26.3	29.5	33.4	37.9	40.7	3.9
6	26.5	29.[illegible]	33.3	37.75	40.65	3.4
7	26.4	29.0	33.15	37.7	40.65	3.2
8	25.9	28.8	32.3	37.6	40.5	2.3
9	25.5	2[illegible].4	32.6	37.55	40.4	1.6
10	32.6	33.3	36.0	39.4	41.4	9.5
11	29.6	32.2	35.4	3[illegible].7	41.25	8.9
12	29.35	32.0	35.0	39.55	41.15	[illegible].4
13	30.4	34.1	36.2	39.45	41.0	11.2
14	34.9	35.3	[illegible].0	40.4	41.9	15.3
15	37.4	3[illegible].2	39.4	41.[illegible]	42.2	18.7
16	39.9	39.7	40.5	41.7	4[illegible]	21.1
17	40.1	40.7	41.0	[illegible]	42.7	22.8
18	41.3	41.6	41.6	42.6	42.[illegible]	24.6
19	41.55	41.3	41.75	42.[illegible]	42.[illegible]	25.0
20	41.[illegible]	41.[illegible]	41.60	42.55	42.9	24.9
21	41.6	42.0	41.75	42.60	[illegible].95	25.[illegible]
Phg	[illegible].32	[illegible].[illegible]3	[illegible].10	2.19	[illegible].05	3.69
Pflow	[illegible].4	71.2	40.2	9.[illegible]	[illegible].6	---
Qflow	10.1	9.07	7.57	5.[illegible]	3.92	12.03

m' – a – m''
[illegible].6 – 1.4[illegible]3 – [illegible]

[illegible] .635 [illegible] 7[illegible]

Tap	A	B	C	D	E	F
1	[illegible]	[illegible].45	[illegible]	[illegible]	[illegible].4	61.7
2	93.[illegible]	[illegible].4	[illegible]	[illegible]	[illegible]	61.65
3	93.35	[illegible].45	[illegible].7	[illegible]	[illegible].4	61.7
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible].6	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible].7	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible].4	49.[illegible]	57.7	[illegible]
7	[illegible]	[illegible]	[illegible]	49.[illegible]	57.65	56.9
8	[illegible]	[illegible]	[illegible]	49.[illegible]	57.3	56.[illegible]
9	[illegible]	[illegible]	[illegible]	49.[illegible]	57.95	57.05
10	[illegible]	[illegible]	53.0	51.4	[illegible].7	57.30
11	[illegible]	[illegible]	33.[illegible]	[illegible]	[illegible]	53.2
12	[illegible]	[illegible]	[illegible]	37.7	49.1[illegible]	53.15
13	[illegible]	[illegible]	34.3	[illegible]	[illegible]	53.45
14	[illegible]	33.7	[illegible]	[illegible]	[illegible].1	[illegible]
15	[illegible]	36.5	[illegible].7	[illegible]	[illegible].1	[illegible]
16	[illegible].4	[illegible].7	40.4	[illegible]	5[illegible].9	54.9
17	[illegible]	40.4	[illegible]	[illegible]	[illegible]	55.1
18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	[illegible].7	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	[illegible].6	[illegible].15	[illegible]	[illegible]
21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pr	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.17
Flow	---	[illegible]	76.5	47.9	[illegible]	14.95
Flow	[illegible]	[illegible].27	[illegible]	7.47	6.22	4.19

m' - a - m"
[illegible].6 - 1.423 - [illegible].5

Pbar [illegible].635"Hg Th 75°

Tap	A	B	C	D	E	F
1	93.3	[illegible].45	72.7	64.[illegible]	60.4	61.7
2	93.[illegible]	[illegible].4	72.65	64.55	60.35	61.65
3	93.35	[illegible].45	7[illegible].7	64.[illegible]	6[illegible].4	61.7
4	94.3	[illegible]1.1	73.1	6[illegible]	6[illegible].6	61.[illegible]
5	[illegible]	51.5	50.[illegible]	4[illegible].7	57.[illegible]	57.[illegible]
6	[illegible]	[illegible]1.3	50.4	49.[illegible]	57.7	56.95
7	[illegible]	51.1[illegible]	50.[illegible]5	49.[illegible]	57.65	56.9
8	[illegible]	51.3[illegible]	50.50	49.5[illegible]	57.3	56.95
9	[illegible]	51.90	50.[illegible]0	49.9[illegible]	57.95	[illegible]7.05
10	[illegible]	53.[illegible]	52.0	51.4	[illegible].7	57.30
11	[illegible]	[illegible].6	33.[illegible]	37.[illegible]	[illegible].4	53.2
12	[illegible].6	[illegible]	32.[illegible]	37.7	49.15	53.15
13	[illegible]	30.9	34.5	[illegible]	50.0	53.45
14	[illegible]	33.7	36.5	40.[illegible]	51.1	54.0
15	[illegible]	36.5	38.7	41.9	5[illegible].1	54.5
16	[illegible].4	38.7	40.4	43.1	5[illegible].9	54.9
17	[illegible]1.4	40.4	41.[illegible]	4[illegible]	[illegible].6	55.1
18	[illegible]	4[illegible].35	43.3	[illegible]	54.[illegible]	[illegible].45
19	[illegible]	42.90	45.7	45.15	[illegible]4.5	[illegible]5.55
20	[illegible].95	43.0	43.6	4[illegible].15	[illegible].45	55.5
21	[illegible]	43.[illegible]	43.[illegible]	4[illegible]	54.5	55.6
Pr	3.[illegible]3	[illegible].74	[illegible]	1.9[illegible]	1.24	1.17
flow	---	[illegible]	76.5	47.9	[illegible].2	14.95
flow	15.[illegible]	10.27	[illegible].03	7.47	6.22	4.19

m' - a - m"
0.7 - 1.423 - 0.5

Pbar 29.630"Hg Tw 75F

Tap	RUN A	B	C	D	E	F
1	92.0	72.3	76.5	69.0	69.5	62.7
2	92.0	72.35	76.4	6[illegible].95	69.45	62.65
3	92.0	72.38	76.4	60.95	69.45	62.65
4	92.7	73.4	76.9	6[illegible].30	69.60	62.75
5	70.5	59.8	65.9	61.2	64.6	60.65
6	70.4	59.7	65.7	61.1	64.6	60.65
7	70.43	59.3	65.7	61.15	64.6	60.65
8	72.4	60.9	66.7	61.[illegible]	65.1	60.90
9	74.3	61.9	67.7	67.4	65.45	61.0
10	75.7	62.8	68.4	67.5	65.30	61.2
11	2.3	17.2	31.1	36.1	43.9	54.35
12	1.1	16.4	30.4	35.2	43.6	54.2
13	2.2	17.3	30.9	35.5	43.3	54.35
14	7.0	20.1	33.5	37.0	50.1	54.75
15	13.1	24.3	36.3	40.3	51.5	55.4
16	17.3	27.0	38.9	42.1	52.6	55.9
17	21.5	29.[illegible]	40.7	43.2	53.5	56.15
18	25.9	32.1	42.2	44.9	54.3	56.6
19	27.2	32.8	43.8	45.4	54.10	56.7
20	27.5	32.9	43.9	45.45	54.35	56.7
21	27.9	33.15	44.1	45.55	54.50	56.75
Phg	3.62	2.95	2.10	1.5[illegible]	1.23	1.07
Pflow	---	91.6	74.95	53.5	33.35	13.70
Qflow	13.12	10.5	9.3	7.9	6.27	4.6

m' – e – m''
[illegible].3 – 1.423 – 0.6

[illegible] [illegible].010 [illegible] [illegible] 7[illegible]

Tap	A	B	C	D
1	[illegible]	[illegible]	37.2	75.5
2	21.3	[illegible]	37.2	75.5
3	21.3	[illegible]	37.2	75.5
4	[illegible]	[illegible]	37.3	75.55
5	[illegible]	[illegible]	24.3	27.3
6	[illegible]	[illegible]	[illegible]	27.7
7	[illegible]	[illegible]	24.1	27.65
8	[illegible]	[illegible]	23.35	27.6
9	[illegible]	[illegible]	[illegible]	27.5
10	[illegible]	[illegible]	24.25	[illegible]
11	[illegible]	13.75	[illegible]	[illegible]
12	[illegible]	[illegible]	30.75	[illegible]
13	[illegible]	[illegible]	31.25	33.15
14	[illegible]	[illegible]	32.35	[illegible]
15	[illegible]	[illegible]	33.5	34.65
16	[illegible]	[illegible]	34.3	[illegible]
17	[illegible]	[illegible]	35.0	[illegible]
18	[illegible]	[illegible]	35.25	[illegible]
19	[illegible]	19.2	35.35	[illegible]
20	[illegible]	19.3	35.4	36.3
21	[illegible]	19.35	35.45	36.35
Ph[illegible]	[illegible]	3.91	2.73	[illegible]
%flow	14.6	[illegible]	10.2	[illegible]
flow	[illegible]	[illegible]	3.43	3.03

a' — a — m''
0.4 — [illegible].423 — 0.6

Pbar [illegible].614"Hg   Tw 75F

[illegible]

Tap	A	B	C	D	E
1	[illegible]	27.[illegible]	31.[illegible]5	70.75	56.4
2	[illegible]	27.1[illegible]	31.25	70.75	56.4
3	[illegible]	27.15	31.3	70.75	56.4
4	[illegible]	27.3	31.45	70.[illegible]	56.45
5	[illegible]	1[illegible].6	24.0	23.9	35.[illegible]
6	[illegible]	1[illegible].3	23.9	[illegible].3	35.15
7	[illegible]	1[illegible].25	23.3	23.[illegible]	35.15
8	[illegible]	13.3	23.5	23.6	35.1
9	[illegible]	13.[illegible]	[illegible]	23.2	34.[illegible]
10	[illegible].3	[illegible].3	25.[illegible]	29.8	35.[illegible]
11	[illegible]	[illegible]	34.7	36.6	35.4
12	[illegible].4	[illegible]	3[illegible].5	36.5	3[illegible]
13	[illegible].3	[illegible]	35.6	37.5	3[illegible].75
14	[illegible]	3[illegible].3	36.95	38.5	40.1
15	[illegible]	[illegible]	38.4	39.3	40.5
16	[illegible]	33.6	39.2	39.9	40.9
17	[illegible]	34.7	39.[illegible]	40.[illegible]	41.15
18	[illegible]	3[illegible]	40.4	40.9	41.4
19	[illegible]	35.4	40.45	40.5	41:4
20	[illegible]	35.5	40.4	40.9	41.4
21	[illegible].0	35.5	40.45	40.95	41.4
Phg	3.1[illegible]	[illegible].7[illegible]	2.53	2.31	2.24
%flow	[illegible]7.2	33.4	30.2	18.05	11.15
Qflow	7.4[illegible]	6.6	5.92	5.08	3.62

m' - o - m"
0.5 - 1.4[illegible]3 - 0.6

Pbar [illegible].615"Hg   [illegible]   75[illegible]

	RUN					
Tap	A	B	C	D	E	F
1	[illegible]7.2	75.3	66.4	56.95	49.45	9[illegible].6
2	[illegible]7.2	75.75	66.35	56.9	49.4	92.6
3	[illegible]7.[illegible]	75.75	66.4	56.95	49.45	92.6
4	[illegible]	76.15	66.3	57.15	4[illegible].55	93.[illegible]
5	19.3	[illegible]5.3	[illegible]	35.6	39.4	[illegible].6
6	19.5	[illegible].1	[illegible]	35.3	39.35	4.1
7	1[illegible]	24.9	[illegible].5	35.3	3[illegible].35	3.9
[illegible]	1[illegible].15	[illegible]4.7	2[illegible].4	35.2	3[illegible].25	3.6
9	1[illegible].6	[illegible]4.[illegible]	2[illegible].6	35.6	39.20	3.0
10	[illegible]3.0	[illegible]7.5	31.[illegible]	36.4	40.[illegible]	[illegible].5
11	34.1	35.[illegible]	37.6	3[illegible].7	41.[illegible]	[illegible].7
1[illegible]	34.6	36.2	37.8	[illegible]	41.6	[illegible]3.4
13	37.1	38.1	39.3	[illegible].55	41.95	[illegible]6.5
14	[illegible].1	39.7	40.[illegible]	41.5	4[illegible].3	[illegible]9.4
1[illegible]	40.9	41.2	[illegible]	[illegible].1	[illegible].6	32.[illegible]
[illegible]	[illegible].3	4[illegible].1	4[illegible].1	[illegible]	[illegible]	33.6
17	[illegible]	[illegible].7	[illegible]	4[illegible].9	4[illegible].9	34.6
1[illegible]	[illegible].75	43.3	42.7	[illegible].6	4[illegible].05	35.4
19	[illegible].9	43.4	[illegible].7	43.6	45.05	35.5
[illegible]	[illegible]3.6[illegible]	[illegible]	42.5	[illegible]	45.0[illegible]	35.3
[illegible]	[illegible]	43.4	42.75	[illegible]	45.05	35.6
Pkg	[illegible]	2.13	2.09	[illegible].15	2.15	2.95
P flow	[illegible]	6[illegible].8	5[illegible].2	[illegible]	13.[illegible]5	---
flow	[illegible].34	[illegible].94	7.65	[illegible]	[illegible].03	11.0

a' - a - a''
0.6 - 1.483 - 0.6

Pbar [illegible].672"Hg Tw 75F

	RUN					
Tap	A	B	C	D	E	F
1	[illegible]1.9	79.25	60.2	7[illegible].6	65.2	60.6
2	[illegible]1.8	79.2	60.15	72.55	65.15	60.6
3	91.9	79.25	60.15	72.55	65.2	60.6
4	[illegible]5.7	80.2	60.6	72.9	65.45	60.3
5	3.3	[illegible].1	31.2	52.55	53.3	55.5
6	2.7	19.9	31.0	52.45	53.2	[illegible].4
7	0.9	19.5	30.3	5[illegible].2	53.1	[illegible].35
8	3.1	20.3	31.[illegible]	[illegible].5	53.3	55.45
9	5.3	[illegible]1.3	3[illegible].1	53.0	53.7	55.55
10	[illegible].7	[illegible]	33.3	54.6	54.7	56.0
11	9.0	[illegible]4.5	33.15	54.3	54.1	55.9
12	10.1	[illegible].7	33.35	54.4	54.45	55.95
13	17.[illegible]5	[illegible].8	36.0	55.9	55.3	56.35
14	21.[illegible]	3[illegible].9	37.7	57.1	56.0	56.65
15	[illegible]	[illegible].0	3[illegible].3	57.3	56.45	56.[illegible]
16	[illegible].0	37.0	3[illegible].5	5[illegible].3	56.[illegible]	56.9
17	[illegible]	3[illegible].1	40.[illegible]	[illegible]9.7	57.0	57.1
18	[illegible]	3[illegible].4	40.7	59.15	57.[illegible]	57.2
19	[illegible].3	3[illegible].55	40.75	5[illegible].2	57.3	57.25
20	3[illegible]	3[illegible].4	40.6	[illegible].05	57.[illegible]5	57.[illegible]
21	3[illegible].9	39.3	40.35	5[illegible].2	57.35	57.25
[illegible]	3.51	[illegible].96	2.42	1.96	1.1	1.10
Pflow	---	---	[illegible]1.3	63.2	37.3	16.35
Sflow	13.04	14.77	10.31	3.56	6.63	4.37

[illegible]

Pbar [illegible] Tw 75F

Tap	A	B	C	D	E	F
1	[illegible]	[illegible]	[illegible]	[illegible]	64.4	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	64.35	60.31
3	[illegible]	[illegible]	[illegible]	67.75	64.35	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	64.60	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	60.1	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	61.1	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	[illegible]	[illegible]	[illegible]	51.6	54.4	[illegible]
12	[illegible]	[illegible]	[illegible]	51.6	54.4	[illegible]
13	[illegible]	[illegible]	51.6	53.1	55.3	57.4
14	[illegible]	[illegible]	53.4	[illegible]	56.2	57.6
15	[illegible]	[illegible]	[illegible]	[illegible]	56.3	[illegible]
16	[illegible]	[illegible]	55.7	56.3	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	57.5	[illegible]
18	[illegible]	[illegible]	[illegible]	[illegible]	57.9	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	57.45	57.35	[illegible]	[illegible]
21	[illegible]	[illegible]	57.60	[illegible]	[illegible]	[illegible]
Phg	[illegible]	[illegible]	1.15	[illegible]	1.00	[illegible]
PFlow	---	---	[illegible]	63.6	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

m' - a - m"
0.3 - 2.10 - 0.5

Pbar 30.045"Hg Tw 73F

Tap	Run A	B	C	D
1	90.6	93.0	93.1	91.5
2	90.6	93.0	93.1	91.5
3	90.58	93.0	93.1	91.5
4	90.75	93.15	93.2	91.55
5	4.3	21.2	32.3	43.2
6	4.4	20.9	32.25	43.0
7	4.3	20.95	32.2	43.0
8	4.2	20.3	32.1	43.0
9	4.3	20.9	32.05	43.1
10	4.25	20.8	32.1	42.95
11	6.5	22.5	33.5	44.5
12	13.6	30.15	40.2	49.5
13	15.5	30.6	40.1	49.5
14	16.7	30.9	40.3	50.2
15	17.6	31.5	41.45	50.6
16	18.0	31.75	41.9	51.05
17	18.3	32.2	42.1	51.3
18	18.5	32.3	42.25	51.35
19	18.55	32.35	42.3	51.4
20	18.50	32.35	42.35	51.4
21	18.50	32.3	42.25	51.4
22	18.55	32.33	42.25	51.4
Phg	3.63	2.93	2.50	1.95
Pflow	14.02	11.70	[illegible]	7.75
Qflow	4.06	3.70	3.35	3.00

m' - a - m"
0.4 - [illegible].10 - 0.5

Pbar 30.039"Hg Tw 73F

R.N

Tap	A	B	C	D	E
1	93.0	93.5	33.25	92.0	61.2
2	93.0	93.5	33.[illegible]	92.0	61.2
3	93.0	93.5	33.2	92.0	61.2
4	93.3	93.75	33.4	92.2	61.3
5	1.5	17.6	30.5	51.6	60.3
6	1.1	17.2	30.0	51.35	60.2
7	0.9	17.1	29.9	51.3	60.1
8	0.4	17.0	29.75	51.15	60.05
9	1.5	17.9	30.6	51.7	60.25
10	3.0	19.2	31.3	52.2	60.6
11	7.5	22.3	34.2	53.3	61.15
12	10.6	25.3	35.7	56.2	6[illegible].4
13	10.5	25.3	35.7	56.0	6[illegible].35
14	12.3	27.0	37.25	57.0	63.0
15	14.7	28.7	38.7	57.9	63.45
16	16.0	30.2	39.6	58.4	63.75
17	16.9	30.7	40.0	58.9	63.9
18	17.4	31.1	40.35	59.1	64.0
19	17.6	31.3	40.45	59.2	64.05
20	17.6	31.3	40.5	59.2	64.05
21	17.5	31.25	40.45	59.1	64.0
22	17.6	31.35	40.5	59.16	64.0
Phg	3.55	2.92	2.44	1.4	1.0
Pflow	48.2	40.1	30.5	21.2	10.95
Qflow	7.5	6.83	5.95	4.97	3.55

m' - a - m"
0.5 - 2.10 - 0.5

Pbar 29.491"Hg Tw 76F

Run

Tap	A	B	C	D	E
1	35.5	37.0	75.5	76.6	65.3
2	35.5	38.0	75.5	76.6	65.3
3	35.55	38.0	75.5	76.6	65.3
4	36.1	38.3	75.7	76.7	65.4
5	13.0	37.0	38.7	54.3	55.95
6	17.2	36.7	38.5	54.15	55.75
7	16.9	36.6	38.35	54.0	55.7
8	17.4	36.85	38.65	54.2	55.73
9	20.3	38.9	40.1	55.1	56.15
10	24.0	41.3	41.6	56.0	56.6
11	26.5	43.0	43.5	57.1	57.0
12	5.2	27.9	31.9	50.3	54.1
13	5.0	27.75	31.7	50.1	54.0
14	8.3	30.5	33.3	51.4	54.5
15	12.6	33.0	35.7	52.5	55.1
16	15.3	35.0	37.0	53.45	55.45
17	17.0	36.4	38.0	54.0	55.7
18	18.4	37.2	38.7	54.3	55.85
19	19.4	37.6	39.1	54.7	56.0
20	19.5	37.9	39.2	54.3	56.0
21	19.4	37.75	39.15	54.75	56.0
22	19.6	37.9	39.3	54.3	56.05
Phg	3.72	2.68	1.6	1.55	1.50
Pflow	93.3	70.05	50.45	30.4	13.1
Qflow	9.60	8.39	7.10	5.51	3.62

m' - a - m"
0.6 - 2.10 - 0.5

Pbar [illegible].4[illegible]"Hg Tw 76F

R.M

Tap	A	B	C	D	E
1	90.4	[illegible].3	73.2	71.8	64.2
2	90.4	82.26	73.15	71.75	64.2
3	90.4	8[illegible].[illegible]5	73.2	71.72	64.2
4	91.0	[illegible].7	73.6	71.95	64.35
5	61.3	59.9	56.9	61.7	59.65
6	61.6	5[illegible].4	56.7	61.65	59.6
7	61.5	5[illegible].4	56.7	61.63	59.58
8	63.0	60.5	57.6	62.15	59.9
9	65.5	6[illegible].5	59.0	63.0	60.35
10	67.7	64.0	60.3	63.7	60.6
11	6[illegible].7	64.3	60.7	63.95	60.75
12	25.3	30.[illegible]	35.9	4[illegible].8	53.75
13	24.2	[illegible].6	35.1	48.4	53.6
14	26.4	31.25	36.4	49.2	54.0
15	30.[illegible]	34.6	3[illegible].9	50.3	54.7
16	35.1	3[illegible].0	41.25	5[illegible].2	55.4
17	37.3	40.2	42.6	53.1	5[illegible].[illegible]
18	39.5	41.3	43.6	53.7	56.1
19	40.4	[illegible].4	44.4	54.1	56.3
20	40.5	42.6	44.5	54.14	56.25
21	40.4	4[illegible].45	44.4	54.1	56.2
22	40.65	4[illegible].6	44.55	54.2	56.[illegible]3
P_{hg}	[illegible].41	2.16	1.98	1.32	0.1[illegible]
Pflow	[illegible]1.5	7[illegible].4	5[illegible].45	3[illegible].15	14.6
Qflow	10.28	9.14	7.32	6.11	4.12

m' - a - m"
0.7 - 2.10 - 0.5

Pbar 29.463"Hg Tw 76F

Tap	RUN A	B	C	D	E	F
1	93.4	73.15	70.9	68.4	60.6	62.1
2	93.3	73.1	70.35	68.37	60.55	62.1
3	93.3	73.07	70.32	68.3	60.50	62.06
4	93.9	73.7	71.15	68.6	60.30	62.25
5	74.2	64.9	60.3	60.5	55.9	60.0
6	74.0	64.75	60.2	60.4	55.8	60.0
7	75.2	65.60	60.9	60.35	56.15	60.15
8	77.6	67.4	62.25	61.30	56.70	60.4
9	79.9	68.9	63.4	62.7	57.20	60.65
10	81.4	69.9	64.3	63.45	57.6	60.30
11	82.3	70.25	64.8	63.10	57.8	60.90
12	2.7	15.1	20.7	31.5	38.15	52.35
13	0.9	13.7	19.3	30.4	37.75	52.2
14	1.7	14.1	20.3	30.9	37.95	52.25
15	7.1	18.4	23.3	33.1	39.20	52.30
16	13.6	22.6	26.3	35.6	41.2	53.5
17	18.8	26.4	29.7	37.9	42.3	54.1
18	23.3	29.7	31.7	39.5	43.1	54.5
19	25.8	31.0	33.4	40.7	43.9	54.9
20	26.15	31.35	33.8	40.95	44.1	54.95
21	26.05	31.25	33.9	40.9	44.05	54.9
22	26.25	31.45	33.9	41.0	44.10	54.95
Phg	3.6	3.04	2.80	2.19	2.02	1.25
Pflow	---	93.00	73.55	54.50	33.05	14.40
flow	12.46	10.375	9.22	7.97	6.19	4.12

m' - a - m''
.0.3 - 2.10 - [illegible].6

Pbar [illegible].446"Hg   Tw 76[illegible]

Tap	A	B	C	D	E
1	93.6	91.9	[illegible].7	1.6	70.3
2	93.6	91.9	90.7	[illegible].6	7[illegible].3
3	93.6	[illegible].9	90.7	[illegible].6	70.3
4	93.7	92.0	[illegible].9	[illegible].7	70.4
5	1.3	20.0	30.9	33.[illegible]	36.[illegible]5
6	1.0	19.9	30.7	[illegible].1	36.[illegible]
7	0.95	19.9	30.6	33.15	36.15
8	0.[illegible]5	19.8	30.5	33.1	36.15
9	1.05	19.9	30.55	33.15	36.[illegible]5
10	[illegible].60	[illegible].4	30.9	33.35	37.35
11	4.70	[illegible].3	3[illegible]	34.6	40.5
12	1[illegible].30	[illegible]	3[illegible].0	35.1	40.55
13	1[illegible].70	[illegible].35	3[illegible].2	[illegible].5	41.05
14	13.7	[illegible]	[illegible]	[illegible]	[illegible]
15	14.[illegible]	30.6	39.6	40.3	41.[illegible]
16	15.2	31.1	3[illegible].95	40.7	[illegible]1.65
17	15.45	31.3	[illegible].15	[illegible].0	41.70
18	15.60	31.4	40.[illegible]	41.1	41.75
19	15.7[illegible]	31.45	40.25	[illegible]1.2	41.75
20	15.70	31.4[illegible]	4[illegible].[illegible]	[illegible].1	[illegible].75
21	15.65	31.4	[illegible].1	[illegible]1.0	41.75
22	15.70	31.4	[illegible].1	[illegible].0	41.75
Phg	[illegible].07	.36	[illegible].29	[illegible]	[illegible].13
Pflow	[illegible]4.9	[illegible]1.5	[illegible].[illegible]	7.7	[illegible]
qflow	4.17	3.66	3.375	3.[illegible]	[illegible].52

m' - a - m"
[illegible].4 - [illegible].10 - [illegible].6

[illegible] Tw 76[illegible]

[illegible]

[illegible]	A	B	C	D	E	F
1	1.[illegible]	[illegible]	[illegible]1.1	[illegible].0	71.7	4.3
[illegible]	[illegible]1.[illegible]	[illegible]2.3	51.1	32.0	71.7	[illegible].3
3	[illegible]1.77	9[illegible].7[illegible]	[illegible]1.10	[illegible].0	71.7	24.3
[illegible]	[illegible]	[illegible].1	[illegible]1.25	[illegible]2.1	71.[illegible]	[illegible].4
[illegible]	[illegible].4	1[illegible].[illegible]	[illegible]7.1[illegible]	30.3	33.7	59.4
[illegible]	[illegible]	1[illegible].15	26.5	30.1	33.45	[illegible]
[illegible]	[illegible]	14.65	26.45	30.0	33.45	5[illegible]
[illegible]	[illegible]	13.95	26.50	30.1	33.50	5[illegible]
[illegible]	[illegible].0	1[illegible].1	27.60	31.1	34.1	59.7
10	[illegible]	17.[illegible]	29.3	32.3	35.2	60.4
11	7.[illegible]	[illegible].0	31.7	34.3	36.6	61.1
12	14.[illegible]	26.[illegible]	36.3	37.3	39.3	63.1
13	[illegible]	[illegible]6.[illegible]	37.4	38.45	3[illegible].7	63.4
14	17.0	[illegible]	3[illegible].5	39.5	40.[illegible]	63.[illegible]
15	1[illegible]	[illegible]	39.6	40.2	41.2	6[illegible].35
16	[illegible]	30.6	40.2	40.7	41.4	64.50
17	[illegible]	31.1	40.5	42.1	41.[illegible]5	64.65
[illegible]	[illegible]	31.4	40.6	41.2	41.7	64.[illegible]5
[illegible]	[illegible]	31.4[illegible]	40.7	41.3	41.[illegible]	6[illegible].9
[illegible]	[illegible]	31.[illegible]	40.7	41.25	41.60	64.[illegible]0
[illegible]	[illegible].7[illegible]	31.45	4[illegible].6	41.15	4[illegible].50	64.75
[illegible]	[illegible]	31.[illegible]	40.75	41.[illegible]0	41.[illegible]5	6[illegible].30
[illegible]	[illegible].6[illegible]	[illegible].9[illegible]	[illegible].25	2.19	[illegible].13	0.[illegible]
[illegible]	[illegible].3	[illegible].3	33.3	27.15	20.1	13.15
[illegible]	7.[illegible]	6.53	6.26	5.6[illegible]	4.[illegible]6	3.9[illegible]

[illegible] 0.5 – [illegible].10 – 0.6

Pbar [illegible].450 [illegible] Tw 75F

[illegible]

Tap	A	B	C	D	E	F
1	[illegible]	[illegible]	[illegible]	74.9	63.2	50.7
2	91.[illegible]	[illegible]	[illegible].77	74.9	63.2	50.7
3	91.	[illegible]	[illegible].75	74.9	63.16	[illegible]
4	[illegible]	[illegible]	51.1	[illegible]	63.4	50.75
5	[illegible]	[illegible]	[illegible].3	34.7	[illegible]	[illegible]
6	[illegible].7	[illegible]	[illegible]	34.3	[illegible]	[illegible]
7	[illegible]	[illegible]	27.7	34.2	35.15	39.6
8	[illegible]	[illegible].1	[illegible].3	34.45	35.55	39.7
9	[illegible].3	[illegible].1	30.3	36.1	[illegible].4	40.3
10	[illegible]	[illegible]	[illegible]	33.2	41.6	[illegible]
11	[illegible]	33.7	35.0	40.0	[illegible]	41.3
12	[illegible].7	[illegible].7	34.6	39.3	[illegible].3	41.0
13	14.7	34.1	35.7	40.1	[illegible]	[illegible]
14	[illegible]	[illegible]	37.7	[illegible]	43.7	41.7
15	[illegible]	[illegible].4	39.0	42.5	44.4	[illegible].05
16	[illegible]	[illegible].6	40.15	43.6	44.7	[illegible]
17	[illegible]	40.3	40.7	43.95	44.95	[illegible].35
18	[illegible]	40.[illegible]	40.9	44.2	[illegible].1	[illegible].4
19	[illegible]	[illegible]	41.2	44.3	45.15	[illegible]
20	[illegible]	[illegible]	41.1	[illegible]	[illegible].1	[illegible]
21	[illegible].5	40.7	[illegible]	[illegible]	45.05	[illegible].4
22	[illegible]	[illegible]	[illegible]	44.3	[illegible].1	[illegible]
[illegible]	[illegible].70	[illegible]	[illegible]	[illegible]	1.96	.14
P. low	---	[illegible]	[illegible]	[illegible].9	32.9	[illegible]
[illegible]	[illegible]	[illegible]	[illegible].16	.07	6.15	[illegible]

m' - a - m"
0.6 - [illegible].10 - 0.6

Poar [illegible].431" [illegible] fw 75[illegible]

Run

Tap	A	B	C	D	E	F
1	91.5	77.5	3[illegible].3	75.[illegible]	6[illegible]	6[illegible].6
2	91.5	77.5	32.75	76.0[illegible]	6[illegible].75	6[illegible].6
3	[illegible]	77.5	[illegible].75	76.05	6[illegible].75	6[illegible].5[illegible]
4	9[illegible]	77.2	[illegible]3.5	77.0	6[illegible].0[illegible]	6[illegible].7[illegible]
5	17.4	31.5	[illegible].7	[illegible]5.2	56.7	55.15
6	16.1	30.[illegible]	[illegible].0[illegible]	[illegible]	56.6	55.1
7	16.0	31.1	55.	[illegible].1	56.6	55.1
8	19.8	33.2	55.5	56.[illegible]	57.1	[illegible].3
9	26.0	37.[illegible]	57.[illegible]	57.5	5[illegible]	55.[illegible]
10	31.[illegible]	40.[illegible]	60.0	5[illegible]	5[illegible].1	56.[illegible]
11	34.3	4[illegible].4	61.[illegible]	60.45	5[illegible].5	56.3
12	[illegible].7	[illegible]	4[illegible].1	51.0	[illegible].4	54.1
13	4.5	[illegible].0	4[illegible]	51.7	54.95	54.[illegible]
14	11.7	[illegible].5	51.5	54.[illegible]	56.[illegible]	54.[illegible]
15	17.2	31.3	54.5	[illegible].1	56.35	55.2
16	[illegible]	[illegible].4	[illegible]	56.1	57.35	5[illegible].4
17	[illegible].0	3[illegible]	56.5[illegible]	56.[illegible]	57.65	55.5
18	[illegible].6	35.4	56.9[illegible]	57.2	57.[illegible]	[illegible].6
19	[illegible].5	36.2	57.0[illegible]	57.5	[illegible].0[illegible]	55.7
20	[illegible]4.0	3[illegible]	57.1	57.75	[illegible].05	[illegible].75
21	[illegible]	36.[illegible]	56.95	57.3	57.35	5[illegible].7
22	[illegible].6	36.[illegible]5	57.15	57.[illegible]	5[illegible].1	5[illegible].75
Phg	4.[illegible]	[illegible].35	1.15	1.0[illegible]	.97	1.15
P flow	---	---	[illegible].	6[illegible]	37.95	37.45
flow	16.5[illegible]5	13.0	10.17	3.[illegible]5	6.64	4.53

m' – a – n''
0.7 – [illegible].10 – 0.6

Pbar [illegible].43"Hg Tw 76F

RUN

Tap	A	B	C	D	E	F
1	[illegible].6	[illegible].3	63.35	70.2	66.5	59.4
2	50.5	[illegible].25	63.3	70.2	66.47	5[illegible].4
3	50.[illegible]	[illegible].25	63.3	70.2	66.45	59.35
4	9[illegible].[illegible]	[illegible]1.3	63.3	70.6	66.3	59.5
5	50.4	[illegible].9	50.3	60.9	60.2	56.6
6	50.1	[illegible].7	50.[illegible]	60.35	60.25	56.61
7	[illegible].6	54.3	51.	61.45	60.6	56.75
8	57.[illegible]	57.[illegible]	52.6	62.55	61.4	57.1
9	62.1	6[illegible].9	54.1	63.6	62.05	57.4
10	6[illegible].1	63.1	55.35	64.35	62.[illegible]	57.6
11	67.0	6[illegible].2	55.95	64.3	62.85	57.75
12	[illegible]	[illegible].5	33.1[illegible]	4[illegible].6	52.3	53.4
13	[illegible].6	1[illegible].[illegible]	34.25	4[illegible].2	5[illegible].6	53.3
14	[illegible].3	24.2	36.65	50.9	53.8	53.3
15	17.[illegible]	[illegible].7	39.5	5[illegible].9	55.0	54.4
16	[illegible]	33.7	41.45	54.5	56.15	54.[illegible]
17	[illegible]0.[illegible]	36.6	42.6	55.4	56.7	55.2
18	[illegible].4	3[illegible].4	43.5	55.9	57.1	55.3
19	[illegible].1	3[illegible].	44.25?	56.35	57.4	55.45
20	3[illegible].[illegible]5	[illegible].25	44.[illegible]	56.4	57.4	55.45
21	3[illegible].75	39.5	44.0	56.3	57.3	55.4
22	[illegible].45	40.0	44.[illegible]	56.45	57.4	55.45
Phg	3.95	[illegible].21	2.1	1.10	1.02?	1.[illegible]
Pflow	---	---	56.3	65.65	43.6	19.15
[illegible]flow	1[illegible].05	14.95	10.22?	[illegible].72	7.1	4.73

m' - a - m"
0.3 - 3.9[illegible] - 0.5

Pbar 30.035"Hg Tw 73F

[illegible]

Tap	A	B	C	D
1	92.4	92.4	90.75	36.3
2	9[illegible].35	9[illegible].35	90.7	36.75
3	9[illegible].3[illegible]	[illegible].3[illegible]	90.63	36.75
4	9[illegible].[illegible]	9[illegible].47	90.3	36.35
5	[illegible].35	16.1	29.7	3[illegible].3
6	[illegible].[illegible]	15.5	29.3	3[illegible].05
7	[illegible].10	15.7	29.[illegible]	3[illegible].0
8	[illegible].0	15.0	2[illegible].15	37.95
9	[illegible].1	15.75	29.4	3[illegible].00
10	3.1	16.65	30.1	3[illegible].7
11	5.[illegible]	1[illegible].20	31.5	3[illegible].8
12	10.[illegible]	[illegible]2.5	35.2	4[illegible].65
13	1[illegible].[illegible]	23.5	35.7	43.15
14	1[illegible].5	24.[illegible]	36.3	43.45
15	13.0	24.7	36.6	43.70
16	3.6	16.7	3[illegible].[illegible]	3[illegible].5
17	3.45	16.[illegible]	30.0[illegible]	3[illegible].4
18	4.3	17.[illegible]	30.[illegible]	3[illegible].[illegible]
19	5.3	1[illegible].[illegible]	31.3	3[illegible].4
20	5.5	1[illegible].6	31.65	3[illegible].75
21	5.9	1[illegible].7	31.55	3[illegible].[illegible]
22	6.[illegible]	1[illegible].[illegible]	31.90	3[illegible].9
23	6.3	1[illegible].[illegible]	31.95	3[illegible].9
24	6.35	15.9	31.96	3[illegible].9
25	6.35	15.9	31.92	3[illegible].9
26	6.30	1[illegible].7	31.35	3[illegible].9
Phg	4.[illegible]4	3.94	[illegible].97	[illegible].31
Pflow	14.6	1[illegible].35	9.95	7.9
Flow	4.15	3.[illegible]0	3.41	3.03

m' – a – m''
[illegible] – [illegible] – [illegible]

Pbar [illegible].715 "Hg   Tw 75F

[illegible]

Tap	A	B	C	D	E	F
1	93.05	[illegible]	30.4	[illegible]	79.6	69.1
2	[illegible]3.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	79.6	[illegible]
4	[illegible]	[illegible]3.3	[illegible]	[illegible].35	79.65	[illegible].15
5	14.4	[illegible]	31.7	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible].6	31.3	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible].6	[illegible]	[illegible]	56.5	57.75
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible].7	[illegible]	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	57.7	[illegible]
11	[illegible]	[illegible]	35.3	[illegible]	[illegible]	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible].3	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible].7	[illegible].75
14	[illegible]	[illegible].7	46.5	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	[illegible]	40.15	61.	[illegible]
16	[illegible]	[illegible]	23.6	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible].6	[illegible]	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	24.4	[illegible].3	53.35	[illegible]
19	[illegible].7	[illegible]	25.9	[illegible]	[illegible]	[illegible]
20	7.6	[illegible]	27.05	[illegible].3	54.6	[illegible]
21	[illegible]	[illegible].4	[illegible]7.7	30.05	[illegible]	57.0
22	[illegible]	[illegible].75	[illegible].05	[illegible]	[illegible].15	57.1
23	[illegible]	[illegible]	28.35	30.4	55.2	57.1
24	[illegible]	[illegible]	[illegible].4	30.45	[illegible]	57.13
25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
26	[illegible]	[illegible]	[illegible].4	[illegible]	[illegible].15	[illegible]
Ph	[illegible]	3.35	3.2	3.05	[illegible]	[illegible]
Pflow	[illegible]	[illegible]	[illegible]	19.[illegible]	[illegible].1	6.[illegible]
Flow	[illegible]	[illegible]	5.43	[illegible]	3.77	[illegible].64

m' - a - m"
0.5 - 3.93 - 0.5

Pbar 29.718"Hg Tw 75F

RUN

Tap	A	B	C	D	E	F
1	93.9	83.8	85.3	74.9	56.1	70.3
2	93.75	83.7	85.2	74.35	56.05	70.[illegible]
3	93.85	83.65	85.2	74.33	56.05	70.25
4	94.2	84.0	85.6	75.1	56.2	70.4
5	37.75	39.2	51.4	51.2	50.4	[illegible]
6	37.40	39.0	51.3	51.0	50.35	[illegible].1
7	37.1	38.8	51.1	50.9	50.35	62.05
8	37.65	39.25	51.4	51.15	50.35	[illegible].15
9	39.9	41.0	52.9	52.2	51.15	[illegible].55
10	42.7	43.35	54.7	53.2	51.9	[illegible]
11	45.4	45.4	56.4	54.5	52.7	63.9
12	51.3	50.1	59.8	57.1	54.3	[illegible]
13	52.[illegible]	50.9	60.5	57.45	54.5	64.3
14	53.1	51.5	60.9	57.7	54.7	64.5
15	54.2	52.3	61.25	5[illegible].15	54.95	64.65
16	1.2	10.4	29.5	35.5	40.3	56.[illegible]
17	0.1	9.0	28.[illegible]	35.05	40.[illegible]	[illegible]
18	2.1	11.0	29.7	35.35	40.45	57.[illegible]
19	6.3	14.3	32.5	37.90	41.7	57.[illegible]
20	10.4	17.9	35.0	39.5	42.9	[illegible]
21	13.0	19.8	36.5	40.0	43.4	[illegible]
22	14.5	20.9	37.5	41.5	43.95	[illegible]
23	15.7	21.9	38.0	41.9	44.[illegible]	[illegible]
24	15.8	22.0	38.1	41.9	44.30	[illegible]
25	16.0	22.05	[illegible]	41.95	44.35	[illegible]
26	15.[illegible]	21.95	38.1	41.90	44.30	[illegible]
Phg	4.15	3.6	3.33	2.13	1.9[illegible]	0.95
Pflow	77.30	61.35	46.75	33.9	21.55	11.
Qflow	9.44	8.43	7.33	6.18	5.05	3.62

m' - a - m''
0.6 - 3.93 - 0.5

Pbar 29.72"Hg Tw 75F

	RUN					
Tap	A	B	C	D	E	F
1	90.8	85.0	76.0	69.0	63.9	62.6
2	90.65	82.35	75.9	68.9	63.85	62.55
3	90.65	[illegible]	75.9	68.95	63.85	62.55
4	91.30	83.5	76.4	69.15	64.05	62.70
5	61.2	59.8	57.3	54.9	54.8	57.[illegible]
6	61.9	59.5	57.1	54.8	54.65	57.75
7	61.8	59.3	57.0	54.75	54.55	57.65
8	63.1	60.4	57.8	55.2	55.05	57.90
9	65.6	62.2	59.4	56.4	55.75	[illegible]
10	67.6	63.8	60.75	57.3	56.4	[illegible]
11	69.5	65.6	62.1	58.3	57.0	[illegible]
12	[illegible]	67.9	63.9	59.0	57.9	[illegible]
13	[illegible]	68.4	64.2	60.1	58.15	59.6
14	73.4	[illegible]	64.5	60.3	58.25	59.7
15	74.1	69.5	65.15	60.65	58.60	59.8
16	10.6	17.1	23.1	29.6	37.9	49.0
17	9.8	16.[illegible]	22.7	29.1	37.6	48.3
18	10.75	17.15	23.5	29.5	38.0	48.95
19	14.90	20.[illegible]	26.1	31.7	39.5	49.8
20	19.7	24.4	29.2	33.9	41.0	50.55
21	23.3	27.[illegible]	31.6	35.3	42.1	51.2
22	[illegible]	29.5	33.3	36.7	42.35	51.6
23	27.7	31.4	34.6	37.8	43.6	52.0
24	[illegible]	31.7	34.8	38.2	43.7	52.0
25	[illegible]	31.85	34.85	38.25	43.65	[illegible]
26	[illegible]	31.75	34.80	38.15	43.60	51.95
Phg	[illegible]	2.96	2.72	2.36	2.09	1.46
Pflow	[illegible]	74.4	59.55	44.4	[illegible]	15.45
Qflow	[illegible]	9.26	8.32	7.20	5.83	4.25

m' - a - m"
0.7 - 3.93 - 0.5

Pbar 29.723"Hg Tw 75F

R N

Tap	A	B	C	D	E	F	G
1	92.9	83.6	79.1	72.7	67.35	60.6	66.1
2	91.75	83.45	78.0	72.6	67.3	60.55	66.05
3	92.50	83.5	77.95	72.62	67.3	60.55	66.04
4	93.5	84.1	78.40	73.0	67.7	60.75	66.13
5	76.1	70.35	67.5	64.45	61.2	56.6	64.35
6	75.35	70.65	67.4	64.35	61.15	56.5	64.3
7	76.50	71.3	67.35	64.55	61.3	56.65	64.35
8	78.90	73.0	69.4	65.7	62.15	57.25	64.65
9	80.9	74.4	70.5	66.6	62.9	57.75	64.35
10	82.1	75.3	71.35	67.3	63.4	57.75	64.95
11	83.0	76.0	71.9	67.8	63.75	58.2	65.05
12	84.3	77.0	72.7	68.55	64.25	58.5	65.25
13	84.4	77.1	72.8	68.6	64.3	58.55	[illegible]
14	84.75	77.5	73.0	68.7	64.45	58.65	65.30
15	85.45	78.0	73.4	67.1	64.65	58.80	65.35
16	[illegible].4	14.3	21.1	27.1	33.4	39.3	56.45
17	1.4	14.1	20.6	26.75	33.1	39.1	56.35
18	1.5	14.25	20.7	26.9	33.2	39.15	56.40
19	5.6	17.[illegible]	23.2	29.0	34.6	40.2	56.7
20	11.5	21.[illegible]	26.9	31.7	36.7	41.5	57.4
21	16.6	[illegible].3	30.3	34.2	38.3	42.8	58.0
22	20.0	[illegible]	32.5	36.0	40.1	43.5	58.4
23	24.4	31.45	35.1	38.1	43.6	44.5	58.9
24	25.45	32.2	35.75	38.2	42.15	44.6	59.0
25	25.75	32.4	35.85	38.9	42.3	44.35	59.0
26	25.5	3[illegible].25	35.7	38.3	42.2	44.3	58.98
Phg	3.6	3.02	2.71	2.42	2.20	1.91	0.95
Pflow	---	[illegible].5	73.25	53.3	43.3	27.45	12.6
Qflow	11.65	10.11	9.18	8.23	7.15	5.64	3.35

[illegible] - a - m
0.3 - [illegible] - [illegible].6

Pour [illegible] Tv 73[illegible]

		[illegible]		
[illegible]	A	B	C	D
1	93.4	95.6	93.9	90.95
[illegible]	93.5	93.5[illegible]	93.[illegible]3	90.[illegible]
3	[illegible]	[illegible]	93.[illegible]	[illegible]
4	93.[illegible]	[illegible]	[illegible]	9[illegible].05
5	[illegible]	13.[illegible]	16.4	34.20
6	[illegible].6	1[illegible].6	[illegible].3	34.0
7	[illegible].5	1[illegible]	26.[illegible]	33.9
[illegible]	[illegible]	1[illegible].45	26.15	33.[illegible]5
[illegible]	[illegible].45	1[illegible]	26.[illegible]	33.90
10	1.70	13.[illegible]	27.1	34.5
[illegible]	3.60	1[illegible].1	[illegible].2	35.6
12	[illegible]	[illegible].1	[illegible].3	3[illegible].3
13	1[illegible]	[illegible]1.1	33.[illegible]	3[illegible].3
14	10.[illegible]	[illegible].6	33.[illegible]	40.35
15	11.[illegible]	[illegible].1	34.1	40.60
16	7.1	1[illegible]	30.[illegible]	3[illegible].1
17	7.[illegible]	[illegible].7	31.30	3[illegible].45
[illegible]	[illegible].15	1[illegible].35	31.[illegible]	3[illegible].75
[illegible]	[illegible].35	1[illegible]	31.[illegible]	3[illegible]
[illegible]	[illegible]	1[illegible].70	31.9	3[illegible]
[illegible]	[illegible]	1[illegible].7	31.95	3[illegible]
[illegible]	[illegible].70	[illegible].75	32.0	3[illegible]
[illegible]	[illegible].70	1[illegible].75	3[illegible]	3[illegible]
[illegible]	[illegible].70	19.75	3[illegible]	39.[illegible]5
[illegible]	[illegible].75	1[illegible].75	3[illegible]	3[illegible]
[illegible]	[illegible]	1[illegible]	[illegible]	3[illegible]5
[illegible]hs	4.[illegible]	3.[illegible]4	[illegible].95	[illegible].40
P[illegible]low	1[illegible]	13.1[illegible]	10.[illegible]	[illegible].15
[illegible]low	4.[illegible]	[illegible]	3.57	3.[illegible]7

[illegible] = [illegible] = [illegible]
[illegible] = 3.[illegible] = [illegible].6

[illegible] Ta 73[illegible]

[illegible]

Trap	A	B	C	D	E	F
1	[illegible]	[illegible]	[illegible].7	[illegible]1.1	70.1	[illegible]
2	[illegible].7	[illegible]	[illegible].6	[illegible]1.[illegible]	70.1	[illegible]
3	[illegible].7[illegible]	[illegible].35	[illegible].7	[illegible]1.1	70.1	[illegible]
4	[illegible]	[illegible]	[illegible].1	[illegible]1.3	70.2	[illegible]
5	[illegible]1.3	[illegible]	[illegible]	3[illegible].6	33.4[illegible]	3[illegible].9
6	[illegible].7	14.[illegible]	[illegible]7.[illegible]	30.[illegible]	33.[illegible]	[illegible]
7	[illegible]	1[illegible].7	[illegible]7.1	3[illegible].1[illegible]	33.15	3[illegible].7
8	[illegible]	[illegible]	27.[illegible]	3[illegible].1	33.1	[illegible]
9	[illegible].1	[illegible]	[illegible]	3[illegible].9	33.4	[illegible]
10	[illegible]	1[illegible].4	30.[illegible]	3[illegible].6	34.[illegible]	3[illegible].35
11	[illegible]	[illegible].3	3[illegible]	3[illegible].5	35.[illegible]	[illegible].75
12	[illegible]	27.35	[illegible]	36.6	[illegible]	3[illegible]
13	17.[illegible]	[illegible].6	3[illegible].35	3[illegible].4[illegible]	3[illegible].7	4[illegible]
14	[illegible].3	[illegible].35	[illegible]	3[illegible].9	40.[illegible]	40.4[illegible]
15	[illegible]	[illegible].3	[illegible]	40.3[illegible]	4[illegible].6	[illegible]
16	[illegible]	1[illegible].35	30.[illegible]	3[illegible].33	34.95	36.9
17	[illegible]	1[illegible].7	[illegible]	3[illegible].9	35.1	37.1
18	[illegible]	[illegible]	31.[illegible]	34.[illegible]	36.[illegible]	3[illegible].7
19	[illegible]	21.6	32.9	34.3	36.[illegible]	3[illegible].15
20	[illegible]	[illegible]	33.[illegible]	3[illegible].3	36.[illegible]	3[illegible]
21	[illegible]	[illegible]2.[illegible]	33.75	3[illegible].4	37.[illegible]	3[illegible]
22	[illegible].1	[illegible].7	33.[illegible]	3[illegible]	37.0	3[illegible].4
23	[illegible]	[illegible]2.7[illegible]	33.[illegible]	3[illegible].6	37.05	3[illegible].4
24	[illegible]	[illegible].75	33.[illegible]	3[illegible].6	3[illegible].05	3[illegible].4
25	1[illegible]	[illegible]	33.[illegible]	3[illegible].6	37.0[illegible]	3[illegible].4
26	[illegible]	[illegible].7	33.[illegible]	3[illegible]	37.0	3[illegible].4
[illegible]	[illegible]	3.[illegible]5	[illegible]	2.65	2.[illegible]5	[illegible].4
P'flow	[illegible].3	4[illegible]	34.[illegible]	26.[illegible]	13.4	1[illegible].6
flow	7.7[illegible]	6.[illegible]1	6.33	5.56	4.77	3.[illegible]

m' - a - m"

[illegible] - 3.[illegible] - [illegible].6

P[illegible] 3[illegible].[illegible]6"Hg   Tw 73F

Tap	A	B	C	D	E	F
1	[illegible]	7.3	[illegible].75	30.3	31.0	66.3
2	[illegible]	17.[illegible]	3[illegible].65	30.5	30.9	66.[illegible]
3	[illegible].6	17.[illegible]	[illegible]	[illegible].5	30.9	66.[illegible]
4	[illegible].4	[illegible]	[illegible]	31.5	31.[illegible]	66.4
5	10.4	[illegible]	37.1	3[illegible].7	[illegible]	[illegible].13
6	10.[illegible]	[illegible].3	36.[illegible]	3[illegible].5	[illegible]	[illegible].16
7	[illegible].75	[illegible]	36.3	3[illegible].6	51.9	[illegible]
[illegible]	1[illegible].1	25.7[illegible]	37.[illegible]	[illegible]	5[illegible].15	55.[illegible]
[illegible]	[illegible]	[illegible].50	[illegible]	40.4	53.3	55.50
10	[illegible].4	31.5	42.4	42.5	54.7	56.[illegible]
11	[illegible]	34.9	45.0	44.[illegible]	56.4	56.[illegible]
12	30.[illegible]	41.[illegible]	50.1	45.1	59.3	57.[illegible]
13	[illegible].4	4[illegible].0	[illegible]	[illegible]	[illegible].7	[illegible].10
14	33.3	[illegible]	51.5	50.35	60.1	[illegible].3
15	[illegible]	45.[illegible]	5[illegible].3	51.20	60.6	[illegible].45
16	[illegible].4	1[illegible].1	30.9	33.5	[illegible].7	53.75
17	[illegible].3	17.[illegible]	30.8	33.45	4[illegible].6	[illegible]
[illegible]	[illegible].0	[illegible]	33.9	[illegible]	[illegible]	[illegible]
[illegible]	[illegible].4	[illegible].3	36.2	37.[illegible]	51.7	[illegible]
[illegible]	[illegible].9	[illegible].0	37.5	3[illegible].10	[illegible].3	55.3
[illegible]	1[illegible].3	27.0	3[illegible].3	39.75	5[illegible].9	[illegible]
[illegible]	13.1	27.3	3[illegible].9	40.2	53.[illegible]	[illegible]
[illegible]	13.4	27.9	39.1	[illegible].4	53.3	55.60
[illegible]	13.[illegible]	27.9	39.1	40.4	53.3	55.60
25	13.[illegible]	27.9	39.1	40.4	53.3	55.6
26	1[illegible].4	[illegible]	39.0	40.3	53.[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible].40	1.[illegible]5	1.33	1.[illegible]
P Flow	---	[illegible]	7[illegible].9	[illegible].65	36.50	15.4
Flow	1[illegible]	[illegible]	9.11	[illegible].16	6.33	4.25

n' - a - n''
0.6 - [illegible] - 0.6

[illegible] Hg   Tw 73F

AIR

Tap	A	B	C	D	E	F
1	[illegible]	76.7	70.6	72.7	67.25	[illegible]
2	[illegible]	[illegible]	70.5	72.6	67.2	[illegible]
3	91.9	[illegible]	[illegible]	72.6	67.2	[illegible]
4	93.1	77.05	[illegible]	[illegible]	67.45	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]	57.65	[illegible]	53.4
7	34.6	43.55	[illegible]	57.62	[illegible]	[illegible]
8	[illegible]	50.7	[illegible]	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	51.9	[illegible]	59.4	[illegible]
10	46.3	[illegible]	[illegible]	[illegible]	60.65	[illegible]
11	[illegible]	[illegible]	[illegible]	61.65	60.6	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	61.4	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	61.65	[illegible]
14	[illegible]	[illegible]	57.5	63.6	61.75	[illegible]
15	[illegible]	[illegible]	[illegible]	64.1	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	1.1	[illegible]	36.4	[illegible]	[illegible]	[illegible]
18	7.1	[illegible]	[illegible]	[illegible]	53.7	[illegible]
19	[illegible]	[illegible]	46.95	[illegible]	[illegible]	57.1
20	17.7	40.9	[illegible]	[illegible]	55.6	[illegible]
21	[illegible]	[illegible]	43.6	[illegible]	[illegible]	[illegible]
22	[illegible]	[illegible]	[illegible]	54.6	56.35	57.6
23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
24	[illegible]	[illegible]	[illegible]	54.9	[illegible]	[illegible]
25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
26	[illegible]	43.65	[illegible]	[illegible]	56.4	[illegible]
[illegible]	[illegible]	[illegible]	1.97	[illegible]	1.16	[illegible]
flow	---	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
flow	[illegible]	[illegible]	[illegible]	7.45	[illegible]	[illegible]

m' – a – m"
0.7 – 3.93 – 0.6

Bar 3[illegible].045 "Hg   Tw 73F

RUN

Tap	[illegible]	B	C	D	E	F
1	61.35	65.4	62.2	67.1	63.4	60.45
2	[illegible].65	65.3	62.1	67.05	63.35	60.4
3	61.45	65.3	62.1	67.05	63.35	60.4
4	63.20	65.35	62.6	67.35	63.60	60.5
5	5[illegible].3	53.[illegible]	52.3	60.15	59.45	58.77
6	57.[illegible]	53.0	52.1	60.05	59.4	5[illegible].75
7	[illegible]	53.6	52.65	60.4	59.55	5[illegible].[illegible]
8	[illegible].2	5[illegible].35	53.95	61.3	60.05	59.05
9	67.7	56.6	55.0	62.1	60.6	59.2
10	7[illegible].[illegible]	[illegible]7.45	55.7	62.65	60.85	59.35
11	7[illegible].1	[illegible].3	56.25	63.05	61.05	59.45
12	7[illegible].6	5[illegible].3	57.1	63.55	61.4	59.56
13	7[illegible].05	[illegible].4	57.18	63.65	61.45	[illegible].6
14	75.6	[illegible].6	57.50	63.75	61.5	5[illegible].64
15	77.4	60.15	57.90	64.15	61.7	59.70
16	[illegible]	33.1	36.1	43.7	53.0	56.0
17	[illegible].7	3[illegible].7	35.7	4[illegible].45	54.9	55.95
18	[illegible]	3[illegible].4	37.0	49.4	55.4	56.20
19	14.[illegible]	37.[illegible]	39.4	51.3	54.4	56.70
20	[illegible].6	3[illegible]	41.3	52.7	55.[illegible]	56.95
21	25.[illegible]	41.[illegible]	42.7	53.6	55.75	57.15
22	[illegible].1	[illegible].4	43.5	54.1	56.1	57.3
23	30.6	42.3	44.25	54.6	56.30	57.35
24	31.[illegible]	43.3	44.4	54.65	56.35	57.35
25	31.[illegible]5	43.35	44.4	54.65	56.35	57.35
26	3[illegible]	4[illegible]	44.3	54.55	56.30	57.3[illegible]
Phg	3.77	[illegible].17	2.0	1.19	1.17	1.[illegible]5
Pflow	---	[illegible].1	65.9	4[illegible].4	[illegible]7.7	1[illegible].75
Qflow	16.5[illegible]	[illegible]	3.93	7.52	5.67	3.[illegible]

n' - a - m"
[illegible].3 - 7.66 - 0.5

[illegible]bar 30.15"Hg Tw 74F

Tap	A	B	C	D	E
1	3.3	9[illegible].9	91.3	33.4	[illegible]1.5[illegible]
2	[illegible]3.[illegible]5	92.9	91.25	[illegible]3.4	31.[illegible]
3	[illegible]3.[illegible]	9[illegible].9	91.25	33.37	[illegible]1.55
4	93.40	93.0	91.5	33.45	31.60
5	1.7	1[illegible].7	26.35	33.35	54.3
6	1.[illegible]	1[illegible].35	25.9	3[illegible].65	54.2
7	1.1	1[illegible].15	25.[illegible]5	33.35	54.15
8	1.0	1[illegible].15	25.9	33.50	54.13
9	1.2	1[illegible].4	26.6	33.65	54.20
10	[illegible].2	13.5	27.0	39.35	5[illegible].60
11	4.1	15.[illegible]	2[illegible].25	40.15	55.1
12	[illegible].[illegible]	[illegible].6	[illegible].25	42.75	56.1
13	11.35	21.65	33.55	43.75	57.35
14	11.9	21.7	33.6	43.77	57.39
15	1[illegible].9[illegible]	[illegible]1.7	33.6	43.77	57.39
16	11.95	21.7	33.6	43.80	57.40
17	[illegible].0	[illegible].73	33.65	43.35	57.42
18	1[illegible].[illegible]	[illegible].35	33.7	43.90	57.43
19	1.3	1[illegible].25	25.85	33.35	54.2
20	1.[illegible]	1[illegible].[illegible]	25.8	33.25	54.15
21	1.1	1[illegible].15	25.75	33.20	54.18
22	1.4	1[illegible].4	26.05	3[illegible].30	54.25
23	[illegible].0	1[illegible].9	26.45	33.6	54.45
24	2.7	13.55	26.85	39.0	54.7
25	3.3	1[illegible].1	27.25	39.2	54.9
26	[illegible].0	14.7	27.75	39.6	55.05
27	[illegible].3	15.0	28.0	39.75	55.15
28	[illegible].32	1[illegible].05	2[illegible].05	39.[illegible]	55.13
29	[illegible].30	15.05	2[illegible].0	39.[illegible]0	55.17
Ph[illegible]	4.[illegible]7	4.25	3.4	2.6	1.45
Pflow	14.95	13.0	10.6	7.25	4.4
Qflow	[illegible].13	3.90	3.52	2.90	2.34

m' - a - m''
0.4 - 7.66 - 0.5

Pbar 30.45"Hg   Tw 74F

	RUN					
Tep	A	B	C	D	E	F
1	93.8	92.9	81.3	75.3	64.14	66.0
2	93.7	92.35	81.25	75.85	64.12	65.97
3	93.65	92.95	81.25	75.35	64.10	65.96
4	93.90	93.25	81.50	75.40	64.20	66.02
5	16.0	25.0	29.55	36.9	[illegible]	51.55
6	15.3	27.6	29.15	36.7	38.00	51.45
7	15.0	27.3	28.9	36.55	37.95	52.42
8	15.5	27.5	29.15	36.60	38.05	52.45
9	16.2	28.4	29.95	37.35	38.35	52.75
10	19.0	30.5	31.9	38.60	39.4	53.15
11	21.35	32.9	33.0	40.1	40.4	53.60
12	[illegible]	35.3	35.1	43.2	41.5	54.7
13	30.7	40.3	39.4	44.3	43.2	55.18
14	30.3	40.4	39.4	44.3	43.2	55.20
15	30.3	40.5	39.4	44.28	43.2	55.13
16	30.3	40.45	39.43	44.3	43.25	55.2
17	31.0	40.65	39.5	44.4	43.3	55.2
18	31.35	40.35	39.7	44.35	43.4	[illegible]
19	6.5	15.3	19.4	29.55	33.25	50.0
20	6.35	15.1	19.25	[illegible]	33.2	49.35
21	6.15	14.95	19.10	29.30	33.15	49.32
22	6.65	15.45	19.55	29.6	33.3	50.0
23	[illegible]	16.35	20.6	30.4	33.9	50.2
24	[illegible]	18.45	21.9	31.3	34.5	50.6
25	5.3	19.60	23.3	32.2	35.0	50.9
26	7.35	21.5	24.35	33.1	35.7	51.25
27	[illegible]	[illegible]	24.9	33.6	36.0	51.4
28	9.1	22.35	25.1	33.7	36.00	51.45
29	9.05	22.3	25.05	33.65	36.05	51.42
Phg	4.59	3.77	3.63	3.2	3.04	---
P.low	41.3	54.4	17.37	20.3	13.7	7.05
Qflow	6.94	6.32	5.63	4.37	4.00	2.575

n' – a – n''
.5 – 7.[illegible] – 0.5

[illegible] Tw 74F

Feb	[illegible]	[illegible]	C	D	[illegible]	[illegible]
1	93.7	[illegible]	79.5	69.6	[illegible]	[illegible]
2	[illegible]	[illegible]	79.45	69.55	63.7	[illegible]
3	[illegible]	[illegible]	[illegible]	69.5	63.7	[illegible]
4	[illegible]	[illegible]	79.65	[illegible]	63.95	[illegible]
5	[illegible]	[illegible]	[illegible]	49.65	54.35	[illegible]
6	[illegible]	[illegible]	[illegible]	[illegible]	54.7	[illegible]
7	[illegible]	[illegible]	[illegible]	49.4	54.7	[illegible]
8	[illegible]	50.0	49.3	[illegible]	54.35	[illegible]
9	[illegible]	[illegible]	50.5	[illegible]	55.15	54.4
10	[illegible]	[illegible]	[illegible]	51.7	55.7	54.63
11	[illegible]	56.1	[illegible]	[illegible]	56.15	[illegible]
12	[illegible]	60.4	56.7	54.6	57.05	[illegible]
13	[illegible]	[illegible]	57.95	55.4	57.4	[illegible]
14	[illegible]	[illegible]	[illegible]	[illegible]	57.4	[illegible]
15	[illegible]	[illegible]	57.95	55.43	57.4	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	57.4	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	57.45	[illegible]
18	[illegible]	[illegible]	[illegible]	55.7	57.5	[illegible]
19	[illegible]	[illegible]	[illegible]	35.5	40.6	51.4
20	[illegible]	[illegible]	27.3	[illegible]	43.45	[illegible]
21	[illegible]	19.35	27.1	35.1	43.35	51.3
22	[illegible]	[illegible]	27.7	35.5	43.45	51.45
23	[illegible]	[illegible]	[illegible]	36.4	46.95	51.65
24	[illegible]	[illegible]	31.0	37.5	49.5	51.35
25	[illegible]	[illegible]	[illegible]	[illegible]	49.95	[illegible]
26	[illegible]	[illegible]	[illegible]	[illegible]	50.6	[illegible]
27	[illegible]	[illegible]	35.95	40.5	50.9	[illegible]
28	[illegible]	[illegible]	36.1	41.1	51.0	[illegible]
29	16.7	[illegible]	36.0	41.02	50.95	[illegible]
Avg	[illegible]	3.1	2.59	2.66	[illegible]	1.6
P. low	[illegible]	[illegible]	41.3	27.1	[illegible]	5.5
[illegible] low	[illegible]	[illegible]	6.95	5.62	3.73	[illegible]

m' = a = m"
[illegible].6 = 7.66 = [illegible].5

[illegible]bar [illegible].369"Hg   Tw   748

Roll

Tap	A	B	C	D	E	F
1	[illegible]	90.35	[illegible]3.9	6[illegible].3	6[illegible].2	55.04
[illegible]	[illegible]	90.7	[illegible]3.[illegible]	60.2	62.15	55.[illegible]
3	[illegible].25	90.7	[illegible]3.[illegible]	6[illegible].2	62.15	[illegible].02
4	[illegible]1.43	91.15	34.3	6[illegible]	6[illegible].4	55.1
5	61.7	67.6	65.[illegible]	54.7	52.9	50.[illegible]
6	61.1	67.[illegible]	65.65	54.5	52.7	50.45
7	6[illegible].95	67.1	64.35	54.4	52.6	50.49
[illegible]	6[illegible].7	68.4	66.[illegible]	55.1	53.2	50.7
9	6[illegible]	72.[illegible]	67.4	56.3	53.9	51.1
10	67.2	7[illegible].25	69.15	57.4	54.3	51.45
11	6[illegible]	73.45	70.1	5[illegible].2	55.3	51.7
12	72.[illegible]	7[illegible]	7[illegible].0	59.3	56.25	5[illegible].15
13	73.1	76.6	7[illegible].61	60.1	56.6	5[illegible].35
1[illegible]	73.15	76.7	7[illegible].65	60.1	56.6	5[illegible].35
15	73.55	76.6	7[illegible].60	60.0	56.55	5[illegible].3
16	73.[illegible]	76.7	7[illegible].60	60.0	56.6	5[illegible].35
17	73.5	77.0	7[illegible].35	60.[illegible]	56.7	5[illegible].4
[illegible]	7[illegible].65	77.[illegible]	73.15	60.45	56.9	5[illegible].53
1[illegible]	[illegible]4.5	[illegible]	28.95	[illegible].4	34.3	41.75
[illegible]	[illegible]3.[illegible]	[illegible]	[illegible].3	28.15	34.55	41.7
[illegible]	[illegible]3.65	[illegible]1.[illegible]	[illegible].5	27.95	34.4	41.6
[illegible]	[illegible]4.75	[illegible].7	[illegible].25	[illegible].6	34.9	41.7[illegible]
[illegible]	[illegible].1	[illegible].3	31.2	30.0	35.95	4[illegible].30
[illegible]	1[illegible].3	[illegible].6	34.0	31.9	37.3	43.1
[illegible]	[illegible].4	[illegible]1.[illegible]	36.[illegible]	33.[illegible]	38.3	43.[illegible]
[illegible]	[illegible].3	3[illegible].3	3[illegible].[illegible]5	35.[illegible]	40.0	44.25
7	[illegible]3.3	37.3	40.9	37.15	40.7	44.65
[illegible]	[illegible].9	37.7	[illegible]1.25	37.35	40.35	44.7
[illegible]	[illegible].7	37.6	41.[illegible]	37.3	40.30	44.65
[illegible]	3.75	[illegible]	[illegible].35	[illegible].6	[illegible].4[illegible]	[illegible].10
[illegible]	9[illegible].45	74.6	5[illegible].3	43.2	29.9	14.7
[illegible] W	1[illegible].4[illegible]	9.[illegible]4	[illegible].3[illegible]	7.10	5.30	4.15

m' - a - m"
0.7 - 7.66 - 0.5

Pbar 29.79"Hg   Tw 73F

RUN

Tap	A	B	C	D	E	F	G
1	92.5	87.2	84.0	73.95	84.3	79.4	73.65
2	92.3	87.1	83.9	73.85	84.2	79.35	73.62
3	92.4	87.2	83.95	73.90	84.25	79.38	73.64
4	93.2	87.3	84.45	79.30	84.65	79.60	73.75
5	76.8	74.1	75.5	70.4	7[illegible].0	75.15	71.65
6	76.3	73.6	73.1	70.15	77.[illegible]	75.0	71.6
7	76.85	74.15	73.4	70.45	78.0	75.1	71.63
8	79.65	76.2	75.3	71.35	79.0	75.3	72.02
9	81.2	77.55	76.3	72.7	79.65	76.3	72.2
10	82.6	78.9	77.35	73.6	80.3	76.7	72.45
11	83.3	79.4	77.8	73.95	80.6	76.35	72.5
12	84.3	80.4	78.5	74.55	81.1	77.2	72.63
13	84.7	80.75	78.8	74.30	81.2	77.3	72.7
14	84.8	80.8	78.8	74.82	81.22	77.3	72.7
15	84.5	80.6	78.7	74.7	81.15	77.25	72.7
16	84.65	80.7	78.75	74.35	81.1	77.3	72.72
17	85.1	81.1	79.10	75.05	81.35	77.4	72.75
18	85.7	81.50	79.55	75.40	81.50	77.55	72.8
19	4.9	12.9	24.1	30.8	48.5	55.40	62.55
20	4.8	12.2	23.3	30.4	4[illegible].1	55.05	62.4
21	4.4	11.9	23.5	30.2	47.9	54.95	62.35
22	4.7	12.9	24.1	30.85	4[illegible].4	55.4	62.60
23	8.4	16.0	26.4	32.3	49.9	56.5	63.0
24	13.3	20.0	30.2	35.7	52.2	57.9	63.8
25	16.6	22.9	32.7	37.7	53.6	58.8	64.2
26	23.0	28.3	37.0	41.1	56.3	60.6	65.0
27	26.4	31.2	39.1	42.8	57.5	61.35	65.35
28	27.1	31.8	39.6	43.2	57.65	61.5	65.40
29	26.85	31.65	39.35	43.05	57.50	61.45	65.35
Phg	3.62	3.2	2.56	2.12	1.03	0.88	0.58
Pflow	---	91.4	74.2	60.1	44.8	29.85	13.95
Qflow	11.32	10.23	9.25	8.35	7.23	5.89	4.04

m' – c – m''
[illegible].3 – 7.66 – [illegible].6

[illegible] Tw 74[illegible]

Tap	A	B	C	D	E
1	[illegible]	[illegible]	[illegible]	90.3	79.95
2	[illegible]	[illegible]	91.83	[illegible]	79.92
3	[illegible]	[illegible]	91.88	[illegible]	79.9
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	25.95	[illegible]	[illegible]
6	[illegible]	[illegible]	25.7	[illegible]	39.6
7	[illegible]	[illegible]	[illegible]	34.1	39.5
8	[illegible]	[illegible]	[illegible]	34.05	39.55
9	[illegible]	[illegible]	25.6	34.1	39.65
10	[illegible]	[illegible]	[illegible]	[illegible]	40.2
11	[illegible]	[illegible]	[illegible]	36.4	41.0
12	[illegible]	[illegible]	[illegible]	[illegible]	43.4
13	[illegible]	[illegible]	33.3	[illegible]	44.15
14	[illegible]	[illegible]	33.3	40.6	44.15
15	[illegible]	[illegible]	33.3	40.65	[illegible]
16	[illegible]	[illegible]	33.35	40.7	44.2
17	[illegible]	[illegible]	33.4	40.75	44.22
18	[illegible]	[illegible]	[illegible]	40.8	44.24
19	[illegible]	[illegible]	[illegible]	37.75	42.0
20	[illegible]	[illegible]	[illegible]	37.7	41.95
21	[illegible]	[illegible]	[illegible]	37.8	41.93
22	[illegible]	16.6	[illegible]	[illegible]	[illegible]
23	[illegible]	[illegible]	[illegible]	[illegible]	42.35
24	[illegible]	17.3	[illegible]	[illegible]	42.55
25	[illegible]	[illegible]	30.9	[illegible]	42.65
26	[illegible]	[illegible]	31.15	[illegible]	42.75
27	[illegible]	17.9	31.20	[illegible]	[illegible]
28	[illegible]	17.95	31.25	[illegible]	[illegible]
29	[illegible]	17.9	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pflow	[illegible]	13.19	10.75	9.05	6.5
flow	[illegible]	[illegible]	3.35	3.26	2.75

m' - a - m"
0.4 - 7.66 - 8.6

Pbar 29.98"Hg   Tw 74F

RUN

Tap	A	B	C	D	E	F
1	92.6	80.5	90.7	80.4	85.3	74.15
2	92.45	80.4	90.6	80.3	85.25	74.1
3	92.55	80.4	90.6	80.3	85.3	74.1
4	92.95	80.7	91.0	80.5	85.4	74.2
5	1.4	4.7	33.1	36.1	55.5	58.2
6	0.7	4.1	32.5	35.5	55.25	58.0
7	0.35	3.9	32.3	35.3	55.05	57.9
8	0.60	4.0	32.6	35.4	55.3	58.05
9	2.0	5.1	33.6	36.1	55.7	58.3
10	5.0	7.9	35.7	37.8	56.8	58.8
11	9.4	10.7	37.9	39.6	58.2	59.4
12	16.2	17.1	42.8	43.1	60.35	60.65
13	18.7	19.0	44.1	43.35	61.15	61.2
14	18.8	19.1	44.15	43.4	61.2	61.2
15	18.8	19.1	44.1	43.4	61.2	61.2
16	18.9	19.1	44.1	43.4	61.2	61.25
17	19.0	19.25	44.25	43.5	61.3	61.25
18	19.35	19.45	44.55	43.65	61.4	61.3
19	3.15	6.1	34.4	36.8	56.15	58.5
20	2.90	5.95	34.1	36.7	56.05	58.45
21	3.10	6.15	34.15	36.7	56.1	58.5
22	4.2	7.20	35.1	37.4	56.6	58.7
23	5.6	8.5	35.9	38.15	57.0	59.0
24	7.1	9.4	36.85	38.6	57.4	59.2
25	8.0	10.0	37.4	39.05	57.6	59.35
26	8.8	10.8	38.0	39.5	57.95	59.5
27	9.1	11.1	38.2	39.65	58.1	59.55
28	9.2	11.2	38.25	39.7	58.15	59.6
29	9.1	11.1	38.2	39.65	58.05	59.5
Phg	4.43	4.33	2.90	2.85	1.4	1.25
Pflow	48.25	40.1	30.6	23.7	15.75	8.45
Qflow	7.50	6.83	5.96	5.25	4.30	3.13

m' - a - m"
0.5 - 7.66 - 0.6

Pbar 29.99"Hg   Tw 74F

RUN

Tap	A	B	C	D	E	F	G
1	32.5	71.4	73.7	66.0	[illegible].2	60.3	93.5
2	32.3	71.45	73.6	65.9	58.15	60.23	93.3
3	32.35	71.[illegible]	73.65	65.95	5[illegible].13	60.28	93.35
4	32.95	71.8	74.0	66.25	58.3	60.25	94.1
5	16.[illegible]	17.5	30.3	34.6	3[illegible].65	52.0	14.1
6	15.6	18.0	30.35	34.35	33.5	51.9	13.4
7	15.35	17.7	30.2[illegible]	34.2	33.4	51.85	13.0
8	16.35	18.5	30.95	34.6	33.75	52.05	14.2
9	19.1	20.65	32.55	35.9	39.5	[illegible].35	17.6
10	22.6	23.6	35.3	37.[illegible]	40.[illegible]5	52.8	22.3
11	25.3	26.4	37.4	39.3	41.[illegible]	53.25	26.1
12	32.6	31.7	41.45	42.6	43.6[illegible]	54.1	34.0
13	35.15	33.6	43.2	43.6	[illegible].25	54.4	36.85
14	35.25	33.65	43.2	43.6	44.[illegible]	54.4	37.0
15	35.2	33.65	43.15	43.6	44.[illegible]	54.4	36.95
16	35.18	33.63	43.13	43.6	44.[illegible]	54.42	36.95
17	3[illegible].55	34.0	43.45	43.[illegible]	44.4	54.45	37.5
18	35.[illegible]	34.4	43.8	44.1	44.5	54.55	3[illegible].0
19	5.4	9.7	23.9	29.[illegible]	3[illegible]	50.7	1.0
20	5.2	9.5	23.75	29.3	35.45	50.65	0.75
21	5.3	9.6[illegible]	23.85	29.[illegible]	35.4[illegible]	50.63	.85
22	7.7	11.3	25.0	30.5	36.2	50.9	3.2
23	10.2	13.6	26.9	31.[illegible]	36.[illegible]	51.3	6.5
24	12.3	15.5	28.5	32.9	37.6	51.6	9.3
25	14.2	16.7	29.45	33.7	3[illegible].1	51.[illegible]	11.4
26	16.1	18.2	30.7	34.5	3[illegible].7	[illegible].05	13.7
27	16.3	18.95	31.3	34.9	38.9	52.15	14.65
28	16.95	19.0	31.35	35.0	3[illegible].95	52.15	14.35
29	16.85	18.35	31.2	34.9	38.[illegible]	52.12	14.65
Phg	4.18	4.01	3.29	[illegible].97	[illegible]	1.75	4.32
Pflow	91.7	73.4	59.2	43.7	[illegible]	11.55	---
Qflow	10.30	9.20	[illegible].28	7.14	5.51	3.63	11.40

m' - a - m"
0.6 - 7.66 - 0.6

Pbar 30.001"Hg Tw 74F

RUN

Tap	A	B	C	D	E	F	G
1	91.7	78.3	74.35	79.05	74.6	70.5	65.8
2	91.4	78.55	74.2	78.9	74.5	70.4	65.75
3	91.5	78.55	74.2	78.9	74.5	70.4	65.78
4	92.9	79.1	74.65	79.25	74.8	70.65	65.37
5	37.15	50.35	50.5	60.5	60.6	61.0	61.15
6	36.9	50.3	50.40	60.4	60.4	60.95	61.1
7	36.7	50.05	50.25	60.3	60.35	60.9	61.06
8	39.7	51.5	51.55	61.25	61.1	61.4	61.35
9	43.5	53.3	53.4	62.7	62.2	62.15	61.73
10	48.4	56.1	55.15	64.15	63.35	62.9	62.05
11	51.0	57.6	56.45	65.15	64.2	63.5	62.35
12	56.6	60.5	58.9	67.05	65.55	64.35	62.35
13	57.6	61.5	59.35	67.75	66.1	64.75	63.0
14	58.3	61.6	59.92	67.[illegible]	66.1	64.77	63.02
15	58.7	61.5	59.35	67.75	66.05	64.75	63.0
16	58.65	61.5	59.87	67.75	66.05	64.78	63.04
17	59.5	61.95	60.25	68.0	66.25	64.9	63.1
18	60.4	62.35	60.55	68.3	66.5	65.05	63.15
19	2.1	32.3	35.4	43.7	51.7	55.0	58.25
20	1.4	32.2	35.2	43.4	51.5	54.35	58.15
21	1.4	32.05	35.1	4[illegible].5	51.45	54.37	58.2
22	5.6	34.05	36.7	49.7	52.45	55.6	58.45
23	10.4	36.6	38.9	51.4	53.7	56.5	58.9
24	14.3	39.0	40.3	52.3	54.9	57.25	59.3
25	17.9	40.7	42.3	54.0	55.7	57.75	59.6
26	21.9	42.65	44.0	55.3	56.75	58.4	59.9
27	23.3	43.4	44.6	55.9	57.1	58.7	60.02
28	23.[illegible]	43.65	44.8	56.0	57.2	58.8	60.05
29	23.4	43.4	44.65	55.85	57.1	58.7	60.01
Phg	4.0	[illegible].62	2.51	1.55	1.35	1.4	1.3
Pflow	---	99.6	75.35	58.65	44.4	30.0	14.75
Qflow	14.23	10.17	9.32	8.25	7.19	5.90	4.15

m' - a - m"
0.7 - 7.66 - 0.6

Pbar 30.019"Hg Tw 74F

RUN

Tap	A	B	C	D	E	F	G
1	93.1	66.75	61.7	58.6	55.55	53.25	55.9
2	92.8	66.6	61.55	58.5	55.4	53.2	55.87
3	92.7	66.5	61.55	58.5	55.45	53.2	55.86
4	94.3	67.05	62.05	58.3	55.7	53.45	56.0
5	60.05	53.3	50.3	49.95	49.2	49.0	53.7
6	59.7	53.2	50.7	49.9	49.15	48.9	53.7
7	61.35	53.75	51.05	50.25	49.35	49.1	53.8
8	65.3	55.3	52.5	51.3	50.1	49.6	54.1
9	69.1	56.9	53.7	52.3	50.9	50.1	54.3
10	71.7	58.1	54.6	53.1	51.4	50.45	54.5
11	73.4	58.7	55.2	53.5	51.8	50.7	54.6
12	76.0	59.0	56.1	54.2	52.3	51.1	54.8
13	77.0	60.15	56.4	54.4	52.5	51.25	54.9
14	77.1	60.2	56.45	54.45	52.5	51.25	54.9
15	77.15	60.15	56.4	54.4	52.45	51.2	54.9
16	76.9	60.1	56.4	54.4	52.45	51.2	54.9
17	78.2	60.6	56.7	54.7	52.7	51.4	55.0
18	78.3	61.05	57.0	55.0	53.0	51.5	55.1
19	1.5	30.15	31.3	35.0	38.3	41.5	49.95
20	1.4	29.9	31.55	34.8	38.15	41.45	49.9
21	1.2	29.75	31.5	34.75	38.05	41.4	49.9
22	5.7	31.75	32.95	36.0	39.0	42.15	50.2
23	12.0	34.25	35.1	37.7	40.2	42.9	50.7
24	18.0	36.7	37.1	39.2	41.35	43.6	51.1
25	22.5	38.2	38.5	40.2	42.25	44.3	51.3
26	27.9	40.35	40.35	41.7	43.2	44.9	51.7
27	30.25	41.45	41.1	42.4	43.65	45.2	51.8
28	30.8	41.6	41.3	42.5	43.3	45.3	51.9
29	30.3	41.4	41.1	42.4	43.7	45.25	51.35
Phg	3.65	2.60	2.6	2.50	2.37	2.34	---
Pflow	---	92.2	75.75	59.7	44.0	29.95	15.3
Qflow	16.34	10.325	9.35	8.32	7.16	5.[illegible]	4.22

m' - a - m"
0.4 - 11.34 - 0.5

Pbar 30.107"Hg Tw 74F

	RUN					
Tap	A	B	C	D	E	F
1	92.7	91.95	87.1	79.45	68.94	77.45
2	92.65	91.90	87.0	79.4	68.90	77.4
3	92.63	91.90	87.0	79.4	68.90	77.4
4	92.90	92.20	87.25	79.62	69.04	77.5
5	16.35	25.4	32.1	35.4	36.8	56.4
6	15.95	25.25	31.95	35.2	36.7	56.35
7	15.75	25.0	31.85	35.15	36.65	56.32
8	15.75	24.8	31.80	35.0	36.55	56.30
9	17.0	25.8	32.6	[illegible]	37.0	56.55
10	19.2	27.9	34.3	37.2	37.8	57.05
11	22.1	30.5	36.4	38.7	39.1	57.9
12	23.7	35.95	[illegible]	42.4	41.9	59.8
13	30.75	37.90	42.45	43.75	42.9	60.4
14	30.80	37.93	42.45	43.79	42.9	60.43
15	30.82	37.95	42.50	43.80	42.9	60.41
16	[illegible]	38.0	42.55	43.82	42.95	60.43
17	30.95	38.08	42.6	[illegible]	42.95	60.45
18	31.25	38.25	42.72	[illegible]	43.1	60.55
19	1.0	12.05	21.2	26.7	30.45	52.3
20	0.75	11.85	21.05	26.4	30.4	52.25
21	0.75	11.80	21.0	26.5	30.35	52.2
22	1.10	12.0	21.25	26.65	30.4	52.35
23	2.50	13.3	[illegible]	27.45	30.95	52.75
24	4.3	14.7	23.4	28.3	31.6	53.1
25	5.6	15.9	24.25	[illegible]	32.25	53.5
26	[illegible]	18.15	26.1	30.7	33.3	54.2
27	9.3	19.2	27.0	31.4	33.75	54.55
28	9.55	19.6	[illegible]	31.65	33.35	54.6
29	9.50	19.5	[illegible]	31.6	33.3	54.6
Phg	[illegible]	3.37	3.49	3.12	3.12	1.36
Pflow	40.5	35.25	28.95	23.35	16.95	11.05
Qflow	6.37	6.40	5.79	5.22	4.46	3.61

m' - a - m"
0.5 - 11.34 - 0.5

Pbar 30.111"Hg Tw 74F

RUN

Tap	A	B	C	D	E	F
1	93.5	84.2	83.45	72.15	67.15	61.25
2	93.45	84.1	83.4	72.1	67.10	61.23
3	93.50	84.05	83.4	72.1	67.10	61.23
4	94.10	84.60	83.7	72.30	67.22	61.30
5	40.9	42.5	52.3	52.0	57.45	57.0
6	40.6	42.3	52.1	51.9	57.4	56.96
7	40.4	42.15	52.0	51.8	57.3	56.95
8	41.1	42.75	52.25	52.15	57.45	57.0
9	43.4	44.5	53.7	53.0	57.9	57.2
10	46.45	46.6	55.3	54.1	58.4	57.4
11	48.95	48.75	57.1	55.25	58.9	57.65
12	54.00	53.10	60.05	57.3	59.9	58.1
13	55.9	54.40	61.20	57.9	60.3	58.25
14	56.05	54.40	61.15	57.9	60.3	58.25
15	55.95	54.45	61.15	57.9	60.3	58.22
16	56.05	54.5	61.20	57.92	60.3	58.22
17	56.25	54.6	61.35	58.0	60.3	58.25
18	56.60	54.95	61.60	58.15	60.45	58.30
19	2.40	11.90	29.5	37.4	50.4	53.9
20	1.90	11.50	29.2	37.3	50.3	53.88
21	1.80	11.35	29.1	37.15	50.3	53.86
22	2.40	11.30	29.50	37.4	50.35	53.90
23	4.70	13.7	30.70	38.3	50.7	54.05
24	7.70	16.3	32.6	39.45	51.35	54.25
25	10.20	18.40	34.3	40.50	51.80	54.5
26	14.30	21.50	36.0	42.15	52.7	54.85
27	16.30	23.3	38.1	43.0	53.1	55.05
28	17.40	23.8	38.4	43.2	53.2	55.13
29	17.35	23.7	38.3	43.15	53.15	55.10
Phg	4.02	3.56	2.61	2.4	1.56	1.40
Pflow	72.9	57.5	42.9	27.7	12.95	5.95
Δflow	9.17	8.175	7.075	5.67	3.89	2.63

m' - a - m"
0.6 - 11.34 - 0.5

Pbar 30.08"Hg   Tw 74F

RUN

Tap	A	B	C	D	E	F
1	82.2	83.4	81.6	74.9	79.8	72.8
2	82.1	83.33	81.5	74.8	79.75	72.78
3	82.03	83.35	81.5	74.8	79.75	72.75
4	82.7	83.90	82.0	75.1	80.0	72.9
5	54.8	65.60	63.6	61.6	71.3	69.05
6	54.6	65.4	63.4	61.5	71.2	69.0
7	54.5	65.35	63.35	61.4	71.15	68.95
8	55.8	66.60	64.25	62.2	71.55	69.2
9	58.4	68.4	65.85	63.25	72.3	69.5
10	60.1	70.2	67.2	64.25	72.9	69.7
11	62.05	71.5	68.25	65.1	73.5	70.0
12	64.8	73.85	70.15	66.35	74.35	70.4
13	65.6	74.70	70.7	66.8	74.65	70.55
14	65.5	74.60	70.65	66.75	74.6	70.55
15	65.55	74.60	70.6	66.8	74.6	70.55
16	65.65	74.70	70.7	66.85	74.65	70.55
17	65.85	74.35	70.8	66.9	74.75	70.6
18	66.35	75.25	71.2	67.1	74.9	70.65
19	1.3	21.1	28.6	35.9	54.75	61.75
20	0.7	20.9	28.4	35.8	54.45	61.6
21	0.6	20.7	28.15	35.55	54.4	61.6
22	1.2	21.2	28.55	35.8	54.7	61.7
23	4.2	23.5	30.1	37.1	55.5	62.15
24	7.5	26.3	32.6	38.9	56.8	62.7
25	10.6	29.0	34.4	40.35	57.6	63.0
26	15.7	33.2	38.1	42.3	59.35	63.75
27	18.5	35.5	39.9	44.1	60.2	64.15
28	19.3	36.15	40.45	44.5	60.35	64.2
29	19.2	36.05	40.4	44.4	60.3	64.18
Phg	3.78	2.37	2.6	2.4	1.3	1.05
Pflow	36.9	72.4	57.15	42.1	26.95	11.9
Qflow	10.02	9.14	8.15	7.01	5.59	3.74

m' - a - m"
0.7 - 11.34 - 0.5

Pbar 30.07"Hg Tw 74F

RUN

Tap	A	B	C	D	E	F	G
1	90.7	37.0	36.9	30.25	82.7	76.5	58.4
2	90.5	36.35	36.8	30.20	82.6	76.4	58.36
3	90.5	36.35	36.3	30.20	82.6	76.42	58.33
4	91.5	37.5	37.4	30.60	82.9	76.60	58.43
5	75.7	73.5	76.1	72.2	76.9	73.4	56.63
6	75.35	73.3	76.0	72.1	76.35	73.3	56.62
7	76.5	74.1	76.6	72.6	77.20	73.5	56.76
8	73.2	75.0	77.9	73.5	77.9	73.9	56.95
9	79.95	77.3	79.1	74.4	78.55	74.2	57.2
10	81.15	78.3	79.9	75.1	79.0	74.45	57.3
11	81.9	79.0	80.5	75.5	79.3	74.6	57.38
12	83.0	80.0	81.4	76.1	79.7	74.35	57.5
13	83.3	80.25	81.6	76.2	79.8	74.95	57.6
14	83.15	80.15	81.5	76.2	79.75	74.9	57.58
15	83.2	80.2	81.5	76.2	79.75	74.9	57.55
16	83.3	80.25	81.6	76.25	79.80	74.9	57.55
17	83.5	80.4	81.75	76.3	79.90	75.0	57.6
18	84.0	81.0	82.0	76.55	80.15	75.15	57.65
19	5.7	11.3	26.3	35.3	50.6	59.0	48.65
20	5.25	10.7	25.8	34.9	50.3	58.8	47.6
21	5.0	10.6	25.5	34.35	50.25	58.3	48.6
22	5.6	11.15	26.2	35.25	50.45	58.9	48.63
23	8.95	14.1	28.5	37.0	51.75	59.6	49.05
24	12.95	1[illegible]	32.6	39.3	53.3	60.5	49.6
25	16.6	[illegible]	34.2	41.2	54.5	61.3	49.35
26	22.7	26.9	38.7	44.6	57.3	62.5	50.6
27	26.5	[illegible]	41.1	46.7	58.4	63.2	51.0
28	27.45	30.7	41.95	47.2	58.8	63.4	51.15
29	27.2	30.55	41.75	47.1	58.75	63.35	51.10
Phg	3.15	.97	2.34	[illegible].06	1.53	1.[illegible]	1.30
Pflow	---	93.25	74.35	55.3	39.7	21.9	12.15
Qflow	11.00	10.40	9.[illegible]3	8.07	6.97	5.05	3.77

m' - a - m"
0.3 - 11.34 - 0.6

Pbar 29.754"Hg   Tw 74F

	RUN				
Tap	A	B	C	D	E
1	91.8	88.3	73.95	72.85	80.2
2	91.75	88.2	73.92	72.86	80.2
3	91.7	88.2	73.90	72.88	80.15
4	91.8	88.4	74.00	72.95	80.2
5	2.2	22.5	25.7	36.5	54.3
6	1.7	22.4	25.6	36.25	54.2
7	1.6	22.3	25.5	36.1	54.15
8	— 1.5	22.2	25.4	36.15	54.1
9	1.8	22.45	25.5	36.25	54.15
10	2.6	22.15	26.05	36.7	54.45
11	4.4	24.6	26.85	37.5	55.05
12	10.1	28.7	30.20	39.8	56.6
13	12.0	29.3	31.1	40.4	57.2
14	12.05	29.9	31.12	40.5	57.23
15	12.1	29.95	31.15	40.5	57.2
16	12.1	29.95	31.13	40.5	57.2
17	12.18	29.97	31.13	40.5	57.2
18	12.2	30.0	31.2	40.55	57.25
19	7.50	26.45	28.65	38.6	55.35
20	7.45	26.4	28.6	38.55	55.85
21	7.4	26.5	28.63	38.55	55.85
22	7.7	26.7	28.8	38.7	55.95
23	8.1	27.1	29.0	38.8	56.05
24	8.5	27.4	29.2	39.05	56.15
25	8.7	27.5	29.3	39.15	56.25
26	9.1	27.75	29.5	39.3	56.35
27	9.25	27.8	29.6	39.35	56.4
28	9.30	27.85	29.70	39.4	56.4
29	9.25	27.8	29.65	39.35	56.4
Phg	4.15	3.03	2.91	2.30	1.35
Pflow	14.6	10.6	7.8	5.9	4.2
Wflow	4.14	3.52	3.03	2.62	2.175

m' - a - m"
0.4 - 11.34 - 0.6

Pbar 29.77"Hg Tw 74F

RUN

Tap	A	B	C	D	E	F
1	92.2	90.9	86.75	75.5	63.0	61.45
2	92.1	90.8	86.70	75.45	62.97	61.42
3	92.1	90.85	86.70	75.45	62.95	61.43
4	92.3	91.1	86.85	75.80	63.02	61.50
5	2.4	16.7	30.6	33.4	36.35	50.4
6	1.9	16.2	30.4	33.2	36.3	50.35
7	1.7	16.05	30.3	33.05	36.2	50.33
8	1.5	15.9	30.2	33.00	36.2	50.35
9	2.8	17.0	31.0	33.6	36.5	50.45
10	5.5	18.9	32.5	34.6	37.15	50.75
11	8.7	21.8	34.6	36.05	38.0	51.2
12	16.4	28.2	39.5	39.95	40.60	52.2
13	19.25	30.5	41.3	41.35	41.40	52.55
14	19.3	30.55	41.35	41.4	41.40	52.55
15	19.35	30.6	41.35	41.45	41.40	52.54
16	19.45	30.65	41.38	41.45	41.42	52.53
17	19.50	30.70	41.40	41.48	41.42	52.53
18	19.70	30.90	41.50	41.50	41.55	52.6
19	4.20	17.90	31.30	34.2	36.95	50.7
20	4.10	17.80	31.75	34.15	36.9	50.7
21	3.95	17.30	31.60	34.05	36.9	50.68
22	4.8	18.4	32.15	34.5	37.13	50.8
23	6.0	19.6	32.80	35.05	37.5	50.95
24	7.3	20.6	33.70	35.8	37.85	51.05
25	8.2	21.5	34.30	36.2	38.05	51.25
26	9.5	22.4	35.1	36.8	38.5	51.4
27	10.0	22.8	35.4	37.0	38.65	51.45
28	10.1	22.9	35.5	37.15	38.8	51.47
29	10.0	22.8	35.45	37.10	38.7	51.44
Phg	4.35	3.6	3.07	2.96	2.82	1.87
Pflow	47.6	39.4	29.75	22.2	13.95	5.77
Qflow	7.46	6.78	5.875	5.08	4.04	2.58

m' - a - m"
0.5 - 11.34 - 0.6

Pbar 29.736"Hg Tw 74F

Tap	RUN A	RUN B	RUN C	RUN D	RUN E	RUN F
1	86.7	77.4	68.9	58.6	50.35	43.75
2	86.55	77.3	68.8	58.5	50.3	43.7
3	86.57	77.4	68.85	58.55	50.32	43.72
4	87.25	77.85	69.3	58.8	50.55	43.85
5	21.9	23.65	25.4	27.1	29.0	33.3
6	21.45	23.35	24.95	26.85	28.9	33.2
7	21.4	23.3	24.90	26.9	28.85	33.25
8	22.1	23.3	25.35	27.2	29.15	33.3
9	25.0	26.45	27.3	28.7	30.05	33.75
10	28.3	29.15	29.7	30.3	30.95	34.3
11	31.9	32.0	32.2	31.9	32.2	34.9
12	38.25	37.2	36.3	35.0	34.4	35.95
13	40.4	39.0	37.8	36.15	35.2	36.3
14	40.35	38.95	37.75	36.1	35.15	36.3
15	40.35	39.05	37.3	36.15	35.15	36.3
16	40.5	39.1	37.9	36.15	35.15	36.3
17	40.7	39.2	37.95	36.25	35.2	36.3
18	41.2	39.65	38.3	36.5	35.4	36.4
19	11.5	15.3	18.5	22.05	27.75	31.65
20	11.3	15.1	18.2	21.9	27.6	31.6
21	11.25	15.05	18.25	21.85	25.55	31.61
22	11.4	15.9	19.05	22.7	26.05	31.8
23	14.9	18.0	20.6	23.7	26.9	32.1
24	17.35	19.9	22.15	24.3	27.7	32.5
25	18.85	21.2	23.3	25.75	28.1	32.9
26	21.3	23.25	24.9	26.85	28.9	33.3
27	22.45	24.2	25.7	27.35	29.3	33.4
28	22.75	24.45	26.0	27.6	29.45	33.5
29	22.6	24.35	25.3	27.5	29.4	33.45
Phg	3.3	3.65	3.55	3.4	3.4	3.1
Pflow	89.7	74.3	60.3	43.4	29.5	14.55
Qflow	10.18	9.26	8:37	7.12	5.85	4.13

m' - a - m"
0.6 - 11.34 - 0.6

Pbar 30.03"Hg Tw 74F

Tap	RUN A	B	C	D	E	F	G
1	93.0	79.4	74.5	68.7	74.1	64.35	60.5
2	92.8	79.3	74.4	68.6	74.0	64.3	60.45
3	92.8	79.3	74.4	68.6	74.0	64.3	60.48
4	94.0	79.9	74.95	69.1	74.2	64.5	60.60
5	36.8	50.6	50.9	49.1	59.8	55.5	55.6
6	36.2	50.3	50.7	48.95	59.7	55.4	55.58
7	35.85	50.2	50.55	48.85	59.65	55.3	55.55
8	38.9	51.75	51.7	49.9	60.45	55.8	55.80
9	43.5	54.15	53.85	51.55	61.6	56.55	56.25
10	47.7	56.0	55.4	52.95	62.6	57.1	56.55
11	50.8	57.[illegible]	56.9	54.2	63.5	58.65	56.85
12	56.6	60.9	59.4	56.15	64.9	58.6	57.4
13	58.5	61.35	60.15	56.75	65.4	58.93	57.55
14	58.35	61.75	60.05	56.65	65.35	58.90	57.52
15	58.45	61.8	60.08	56.65	65.35	58.88	57.5
16	58.6	61.9	60.15	56.72	65.4	58.90	57.52
17	58.95	62.1	60.28	56.83	65.42	58.96	57.53
18	60.1	62.7	60.70	57.15	65.72	59.12	57.62
19	1.2	32.7	36.2	36.95	51.0	49.9	52.60
20	0.7	32.5	36.05	36.75	50.9	49.8	52.58
21	0.65	32.4	35.95	36.7	50.35	49.82	52.62
22	3.45	34.0	37.2	37.75	51.5	50.30	52.80
23	8.35	36.1	39.25	39.35	52.75	51.1	53.35
24	12.7	38.4	41.10	40.8	53.3	51.9	53.65
25	15.8	40.1	42.4	42.1	54.6	52.3	53.9
26	20.3	42.5	44.3	43.7	55.9	53.0	54.3
27	22.8	43.7	45.2	44.4	56.45	53.35	54.5
28	23.4	44.0	45.45	44.65	56.55	53.45	54.55
29	23.05	43.3	45.35	44.55	56.45	53.4	54.50
Phg	3.8	2.45	2.4	2.34	1.56	1.76	1.64
Pflow	---	90.45	74.65	61.85	44.9	28.05	16.4
Qflow	14.42	10.22	9.27	8.47	7.25	5.71	4.25

m' - a - m"
0.7 - 11.34 - 0.6

Pbar 30.05"Hg   Tw 74F

	RUN					
Tap	A	B	C	D	E	F
1	92.7	67.4	64.35	70.1	67.4	56.4
2	92.4	67.2	64.2	70.0	67.3	56.38
3	92.2	67.2	64.2	70.0	67.3	56.38
4	94.0	67.7	64.6	70.4	67.55	56.5
5	59.7	54.55	54.1	62.4	62.1	54.15
6	59.35	54.4	53.9	62.3	62.0	54.1
7	61.5	55.2	54.6	62.75	62.3	54.2
8	65.5	56.85	55.3	63.7	63.0	54.5
9	69.05	58.3	57.0	64.6	63.6	54.8
10	71.65	59.2	57.75	65.15	64.0	54.95
11	73.2	59.9	58.3	65.6	64.25	55.1
12	75.9	60.9	59.15	66.2	64.7	55.3
13	76.45	61.15	59.3	66.3	64.8	55.33
14	76.05	61.0	59.2	66.25	64.7	55.32
15	76.25	61.05	59.25	66.25	64.7	55.30
16	76.5	61.15	59.3	66.25	64.75	55.30
17	76.85	61.25	59.4	66.35	64.8	55.32
18	78.15	61.7	59.8	66.7	65.1	55.45
19	2.4	32.5	36.4	49.15	53.0	50.25
20	1.8	32.3	36.3	49.0	52.85	50.2
21	1.7	32.2	36.15	49.0	52.9	50.2
22	5.7	33.6	37.2	49.35	53.4	50.45
23	11.4	35.8	39.15	51.15	54.3	50.8
24	17.4	38.1	41.05	52.6	55.3	51.25
25	21.2	40.0	42.2	53.5	55.9	51.5
26	27.2	42.0	44.0	54.9	56.85	51.95
27	30.45	43.1	44.95	55.6	57.4	52.15
28	31.15	43.55	45.25	55.75	57.50	52.2
29	30.7	43.35	45.05	55.7	57.4	52.18
Phg	3.57	2.6	2.37	1.73	1.65	1.9
Pflow	---	33.8	71.3	53.45	37.55	16.1
Qflow	16.4	10.13	9.07	7.83	6.53	4.31

m'
0.3

Pbar 30.161"Hg Tw 74F

RUN

Tap	A	B	C	D	E
1	93.3	83.85	73.15	83.9	81.4
2	93.25	83.80	73.12	83.85	81.4
3	93.27	83.75	73.10	83.85	81.3
4	93.4	83.90	73.25	84.0	81.5
5	1.9	3.8	6.0	29.4	38.65
6	1.6	3.6	5.80	29.2	38.55
7	1.35	3.5	5.75	29.05	38.45
8	1.3	3.45	5.65	29.1	38.4
9	1.45	3.6	5.70	29.1	38.45
10	2.4	4.3	6.5	29.8	38.85
11	4.35	4.8	7.7	30.75	39.80
12	10.0	11.0	12.0	34.25	42.55
13	12.1	12.8	13.45	35.4	43.45
14	12.1	12.8	13.55	35.45	43.45
15	12.1	12.75	13.35	35.45	43.45
16	12.08	12.8	13.53	35.4	43.43
Phg	4.98	4.85	4.78	3.05	2.57
Pflow	14.85	13.0	10.98	8.85	6.90
Qflow	4.175	3.90	3.53	3.22	2.80

m'
0.4

Pbar 30.33"Hg   Tw 74F

RUN

Tap	A	B	C	D	E	F	G
1	92.6	82.3	85.3	75.95	84.25	74.35	63.82
2	92.55	82.25	85.25	75.85	84.2	74.83	63.8
3	92.6	82.2	85.3	75.8	84.22	74.83	63.73
4	93.0	82.5	85.5	75.95	84.26	74.90	63.83
5	17.0	18.4	32.6	34.8	54.45	55.4	54.0
6	16.6	18.1	32.3	34.6	54.3	55.35	53.95
7	16.4	18.0	32.2	34.5	54.2	55.30	53.9
8	16.5	17.9	32.25	34.6	54.25	55.35	54.0
9	17.6	19.0	32.0	35.1	54.5	55.6	54.05
10	19.9	21.1	34.8	36.4	55.5	56.2	54.35
11	22.9	23.4	36.7	38.1	56.7	56.9	54.7
12	29.4	29.0	41.2	41.4	59.3	58.55	54.6
13	31.3	30.6	42.6	42.6	60.1	59.2	55.95
14	31.4	30.6	42.65	42.6	60.1	59.2	55.95
15	31.3	30.55	42.6	42.6	60.05	59.15	55.9
16	31.2	30.45	42.5	42.55	60.0	59.1	55.9
Phg	4.73	4.58	3.5	3.2	1.7	1.5	1.45
Pflow	40.0	33.75	27.3	21.75	15.7	10.1	5.1
Qflow	6.83	6.25	5.68	5.04	4.30	3.44	2.42

m'
0.5

Pbar 30.362"Hg Tw 74F

RUN

Tap	A	B	C	D	E	F	G	H
1	93.4	89.6	90.4	82.9	75.9	67.8	60.7	55.2
2	93.2	89.5	90.3	82.8	75.8	67.75	60.65	55.2
3	93.2	89.45	90.3	82.7	75.9	67.8	60.65	55.23
4	93.5	89.8	90.7	83.1	76.1	68.0	60.7	55.25
5	40.2	42.4	50.3	50.0	50.0	49.7	49.55	51.55
6	40.0	42.3	50.2	49.8	49.9	49.6	49.5	51.54
7	39.7	42.0	50.0	49.9	49.8	49.55	49.45	51.53
8	39.9	42.2	50.1	50.0	49.9	49.6	49.5	51.55
9	42.2	44.2	51.8	51.2	50.8	50.3	49.9	51.7
10	45.1	46.7	54.0	53.1	52.3	51.25	50.5	51.9
11	---	49.0	55.3	54.7	53.6	52.2	51.0	52.1
12	53.3	54.1	60.1	58.1	56.5	54.1	52.4	52.5
13	55.3	56.0	61.9	59.4	57.5	54.9	52.8	52.65
14	55.3	55.9	61.35	59.4	57.45	54.9	52.75	52.66
15	55.2	55.8	61.75	59.35	57.4	54.85	52.7	52.62
16	55.0	55.6	61.6	59.2	57.25	54.8	52.65	52.61
Phg	4.2	3.35	2.95	2.8	2.6	2.4	2.15	1.65
Pflow	72.9	64.6	55.0	44.9	35.5	24.9	15.2	5.0
Qflow	9.17	8.65	8.00	7.24	6.40	5.38	4.12	2.41

m'
0.6

Pbar 30.336"Hg   Tw   74F

RUN

Tap	A	B	C	D	E	F
1	86.3	79.2	72.3	66.0	59.1	52.4
2	86.2	79.15	72.2	65.9	59.05	52.4
3	86.1	79.2	72.2	65.9	59.02	52.45
4	86.3	79.7	72.8	66.25	59.2	52.55
5	59.0	57.0	54.9	53.2	51.1	49.25
6	58.6	56.85	54.75	53.15	51.0	49.2
7	58.4	56.7	54.65	53.05	50.95	49.2
8	58.91	57.8	55.4	53.75	51.3	49.45
9	62.2	59.6	56.3	54.65	52.0	49.65
10	64.3	61.3	58.2	55.55	52.5	49.9
11	65.8	62.6	59.1	56.4	53.15	50.1
12	68.3	65.0	61.1	57.75	54.0	50.4
13	69.7[illegible]	65.85	61.8	58.25	54.3	50.55
14	69.60	65.8	61.7	58.15	54.3	50.55
15	69.5	65.65	61.6	58.1	54.25	50.55
16	69.2	65.4	61.45	58.0	54.2	50.5
Phg	3.7	3.37	3.04	2.71	2.45	2.1
Pflow	36.3	70.1	54.8	40.33	25.0	10.15
Qflow	10.01	8.99	7.98	6.36	5.40	3.44

m'
0.7

Pbar 30.10"Hg Tw 75F

RUN

Tap	A	B	C	D	E	F	G
1	81.1	76.45	71.6	66.6	61.9	53.15	90.05
2	81.0	76.4	71.5	66.45	61.85	53.1	89.95
3	80.95	76.3	71.45	66.4	61.85	53.15	89.85
4	81.5	76.9	71.8	66.8	62.05	53.25	90.6
5	68.35	65.7	62.95	60.1	57.6	51.1	74.0
6	68.15	65.6	62.3	59.95	57.55	51.0	73.85
7	68.65	66.0	63.2	60.25	57.7	51.05	74.35
8	70.2	67.35	64.25	61.65	58.25	51.4	76.7
9	71.8	68.6	65.25	61.8	58.75	51.65	78.5
10	72.7	69.4	66.0	62.3	59.15	51.8	79.7
11	73.5	70.1	66.45	62.7	59.4	51.9	80.6
12	74.65	70.9	67.0	63.2	59.7	52.1	81.9
13	74.9	71.2	67.2	63.4	59.85	52.15	82.4
14	74.75	71.1	67.4	63.35	59.8	52.15	82.3
15	74.5	71.0	67.3	63.25	59.7	52.1	82.1
16	74.35	71.3	67.2	63.1	59.7	52.1	81.6
Phg	3.45	3.15	2.75	2.47	2.65	2.1	3.85
Pflow	89.4	75.3	59.55	44.8	30.05	15.05	---
Qflow	10.17	9.32	8.32	7.23	5.90	4.2	11.35

BIBLIOGRAPHY

1. Discharge Through Orifices in Series. Summary of tests made at Rice Institute. W. J. Motart, Mechanical Engineering, Vol. 44, No. 11, Nov. 1922, PP. 764-765.

2. Sur la Contraction d'un Jet Issu d'un Orifice en Mince Paroi. G. Pittaye, Academie des Sciences - Comptes Rendus. Vol. 212, No. 10, March 10, 1941, PP. 336-339.

3. Die Doppelblende. K. Salzholz, V.D.I. Kiel, Forschung auf dem Gebiete des Ingenieurwesens, Vol. 7, No. 4, July-August 1936, PP. 191-201.

4. Fluid Meters - Theory and Application. Part I. Report of A.S.M.E. Special Research Committee on Fluid Meters, 1937.

5. Orifice Coefficients. Recommendations of the joint A.G.A.-A.S.M.E. Committee for construction and installation of pipe orifices, 1936.

6. Fluid Meters - Their Selection and Installation. Part III. A.S.M.E. Publication, 1940.

7. Flow Measurement, A.S.M.E. Publication, 1940.

8. Power Test Codes - Information on Instruments and Apparatus. Part V. A.S.M.E. Publication, 1940.

9. Hydraulic Measurements. Herbert Addison, John Wiley, 1946.

10. Elementary Fluid Mechanics, H. Rouse, John Wiley, 1946.